ZOO PUBLISHING

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3DCreative

HUNTED

We have hunted down and captured the best Artists for Interviews, Articles, Tutorials, Making Ofs, Galleries & Challenges for 3DCreative Magazine!



ARTICLES
'Kane & Lynch: Dead Men', '3D Game Textures' & 'Geico Gecko'



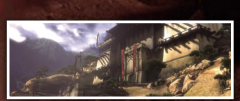
INTERVIEWS
Marco Spitoni on 'Code: Guardian', Lukas Jevcak & Alessandro Baldasseroni



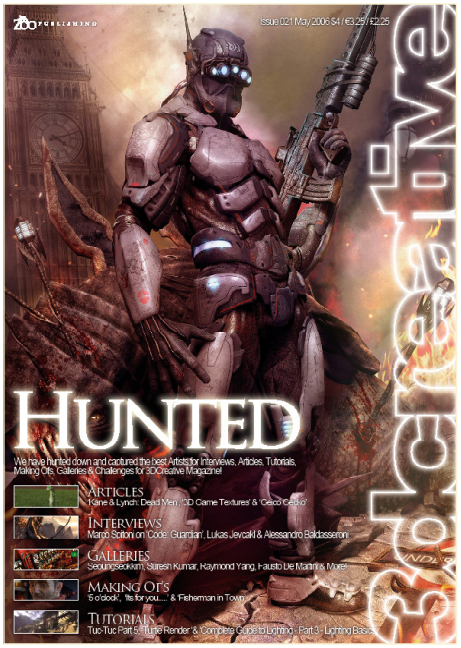
GALLERIES
Seoungseokkim, Suresh Kumar, Raymond Yang, Fausto De Martini & More!



MAKING OF'S
'5 o'clock', 'Its for you.....' & 'Fisherman in Town'



TUTORIALS
Tuc-Tuc Part 5, 'Turtle Render '& 'Complete Guide to Lighting - Part 3 - Lighting Basics'



Editorial

So, May is here and in the UK we are having an unusually early start to the Summer. We're not quite cranking up the air conditioning quite yet but it is pleasant - it's nice, very nice. It has put us all in a good mood, far away from the doom and gloom of the long, cold winter (apologies to our Scandinavian readers; I know your winters are much longer and colder than ours, but hey, that's why you can ski better than us so it's all fair in the end). Anyway, enough chat about the weather; this month's issue should reflect our happy nature as it is a monster issue, and we've gone all out this month. This month we feature an exclusive interview with Marco Spitoni, creator of the newly completed "Code: Guardian" short, plus another exclusive interview with Alessandro Baldasseroni, one of my personal all-time favourites (hence this month's cover). Lukas Jevcak, Lead Object Artist of 10tacle Studios also talks to us this month about his amazing work. The Tuc-Tuc now reaches the penultimate part, and we hope that all of you who have been following it have improved those shader, lighting and rendering skills! Only one more part to go now before we announce the new tutorials series... A big "thanks" finally goes out to all of you who have sent in suggestions for tutorials. We have an enormous list and we are pairing them up with the best artists for the job as we speak (or as I type). So, Including the Galleries, Making Ofs and the Challenge, this is another great value issue. Ed

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Free Stuff!

Wherever you see this symbol, click it to download resources, extras and even movies!



Contents

What's in this month:



Marco Spitoni — 006
On his Incredible Short Movie 'Code: Guardian'


Lukas Jevcak — 014
Lead Object Artist,10tacle Studios


Alessandro Baldasseroni — 027
The Artist Responsible for This Month's Cover!

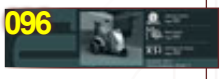

Kane & Lynch: Dead Men — 037
Next Gen Games Series with IO Interactive


3D Game Textures — 045
Create Professional Game Art Using Photoshop


Geico Gecko — 066
Framestore NY's New Spots

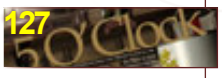

Galleries — 087
10 of the Best 3D Artworks


Stylised Animal Challenge — 072
This Month's 10 Finalists


Tuc-Tuc — 096
For 3DSMax, Maya, C4D, LW & XSi


Turtle Render — 097
An Introduction to the Render Software


Guide to Lighting — 105
Part 3 - Lighting Basics


5 O'Clock — 127
Project Overview by Gustavo Sandrini Groppo


Its for you..... — 136
Project Overview by Kevin Beckers (Tycane)


Fisherman in Town — 146
Project Overview by Suresh Kumar


Recruitment — 154
Job Vacancies


About Us — 158
Zoo Publishing Information & Contacts

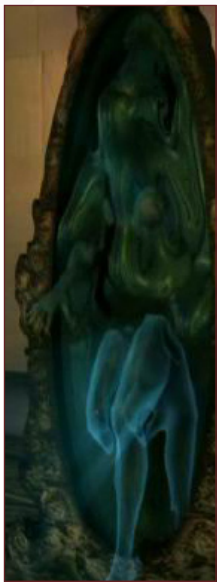
CONTRIBUTING ARTISTS

Every month, many creatives and artists around the world contribute to 3DCreative Magazine. Here you can read all about them. If you would like to be a part of 3DCreative or 2DArtist magazines, please contact: ben@zoopublishing

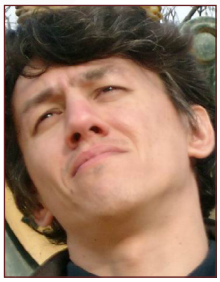
TUC-TUC

The Tuc-Tuc Tutorial Artists. These wonderful people are responsible for translating our 3D Studio Max content for Cinema 4D, Lightwave, Maya & Softimage XSi. Most of them have been with us since the original Joan of Arc series, and all have worked on the highly popular Sword Master Series...





BOGDAN HORDUNA



Is a 3D VFX Artist, in Iasi, Romania. He started back in '99 with 3D Studio Max, but in 2000 trained in Maya. He has been a Modeller and Texturer for a few 3D animated movies games, and is also a Modeller, Dynamics & Particles, Lights & Render Supervisor for many commercials, music videos and industrial presentations.

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LUCIANO IURINO

Started back in '94 with 3DStudio on MS-Dos as a Modeler/Texture Artist. In 2001, he co-founded PM Studios and still works there as Lead 3D Artist. They recently developed the videogame "ETROM – The Astral Essence". He also works freelance for magazines, web-portals, GFX & videogame companies. He recently left the 3DS Max environment to move on to XSI.

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GIUSEPPE GUGLIELMUCCI



Is a Freelance 3D Modeller/Animator. He began using computers with the epoch of the vic20 & Cinema4d was his 1st 3D software. He started working in the field of CG in 1999 in Commercial Design. In '03 he worked on "ETROM - The Astral Essence", an RPG video-game for PC, developed by PMstudios. He currently hopes to work in the video-games industry & develop his own game.

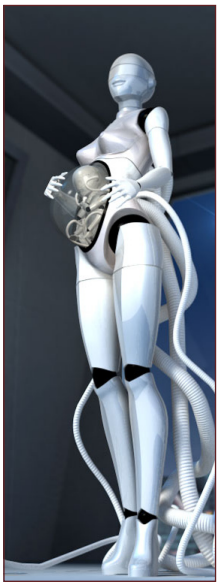
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NIKI BARTUCCI

Is a Freelance 3D Modeler, in Italy. She started working in the field of Computer Graphics in 2000 as an Illustrator & Web Designer. In 2003 she started using 3D software, such as C4D & 3DS Max. In that year she worked on "ETROM - The Astral Essence", an RPG video-game for PC, developed by PMstudios. She is currently a freelancer, specialising in commercials.

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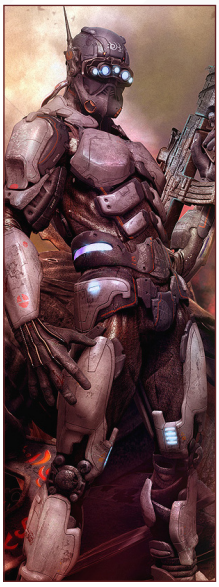
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Alessandro Baldasseroni

Learned Auto CAD working as a CAD operator in a telecommunication firm in '96. Meanwhile, he began to learn & practice working with 3D Studio Max & enjoyed it so much he started to translate his passion for CG into a job in the field. Two years ago he submitted his portfolio to Milestone, a leading Italian videogame firm, and they hired him! He still works today as a digital artist.

www.eklettica.com baldasseroni@gmail.com



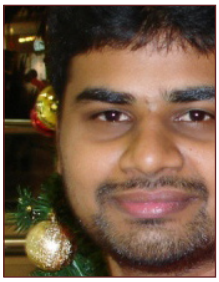


Roman Kessler



Is a Freelance 3D Artist, in Germany. In '93 he made his 1st 3D model, using a shareware 3D software for DOS that was very limited. He got addicted & started with Lightwave in '97. Since 2005 he has worked professionally as a Freelancer. He likes all 3D tasks equally, with little preference to modelling and texturing. Besides client-based work, he also works on personal animation projects.

www.dough-cgi.de



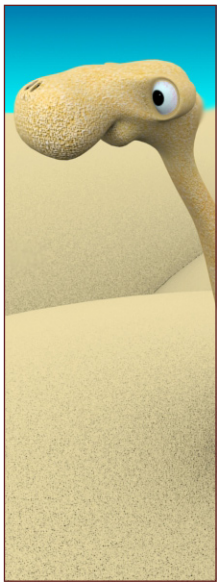
Suresh Kumar

Freelance 3D Artist, Bangalore, India, Started learning CG in 2001 with 3D Studio Max 4.0. In 2004 I worked on an animated series "Higgly Town Heroes" at Jadooworks Animation Studio, Disney. He's also worked on many PS2 & PSP games. He is now freelancing & specialises in Character & Organic models for games & commercials.

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Mim Armand



Graduated twice; once in graphics & the other time in agricultural engineering! He has been working in 3D for less than 3 years, and for more than 9 years in 2D! He is currently employed as a Graphic Designer and is searching for opportunities to make his first short...

http://mim-armand.cgsociety.org

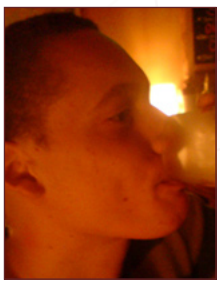
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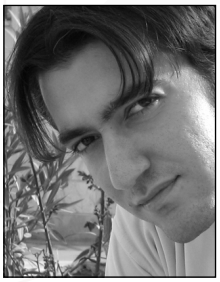


Kevin Beckers



A.K.A Tycane, got hooked on 3D after an encounter with Raydream back in '98, and hasn't done anything else ever since, although he did switch to Maya and currently works with 3DS Max. He's self taught, and currently teaching a master class in 3D at the Hogeschool Zuid in Maastricht, in Holland, hoping some day to get the chance to show what he's worth...

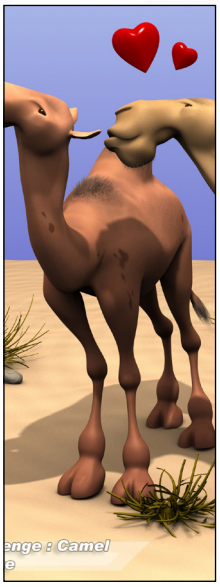
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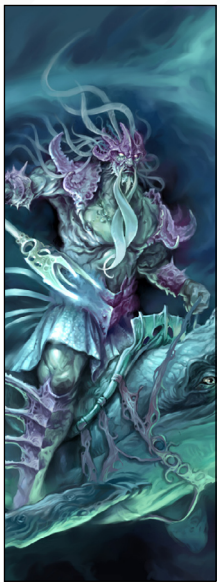


Shahin Fathi Djalali

I'm currently a master degree industrial design student. I have been working in 3D for more than 6 years, doing both industrial & cartoon style models. I often use 3DS Max for modeling and presentation, but I use Solidworks for industrial & product models. currently, I work as a freelance industrial designer & CG Artist, specialising in character design, in Iran.

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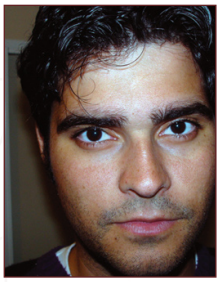


Lukas Jevcak



I started as a 3DArtist in 1996. I currently work as a lead object artist for 10Tacle Studio Slovakia on the game 'Elveon'. I mainly use 3DStudio Max, Maya & Photoshop. In the last few years I have worked on game projects like UFO: Aftermath, Freedom Fighters (2003, EA,), Hitman: Contracts (2004, Eidos, Inc.) & Heretic Kingdoms: The Inquisition.

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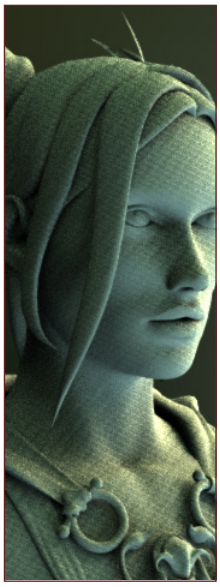


Gustavo Groppo

Has had a passion for CG since he began in 2002 when he opened 3DS Max for the first time... and still practices every day. He is a self-taught 3D artist & considers it a great way to learn. He likes to create photo-realistic stuff & product design and is studying character development as he wishes to work on movies in the future. He currently works as a 3D artist at a studio in Brazil. gugroppo@gmail.com

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Cesar Alejandro Montero Orozco



Is a 3D Artist & Computer Engineer, in Zapopan Jalisco, Mexico. He believes in the balance in life, and all of its aspects. He appreciates his health above anything else. His career goal is to tell compelling stories using CG in feature films.

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From the maker of the short animations “Join the Empire!” and “The Hunt”, Marco Spitoni has just finished his latest endeavour “Code Guardian” - an action packed battle between two opposing forces. He talks exclusively to 3DCreative about this amazing project...

“A fight in a ‘Pearl Harbour’ style setting would be more exciting with rich visuals and interesting situations, like the P-51 sequence which had inspiration taken from the King Kong movie…”

CODE . . . GUARDIAN

Marco Spitoni

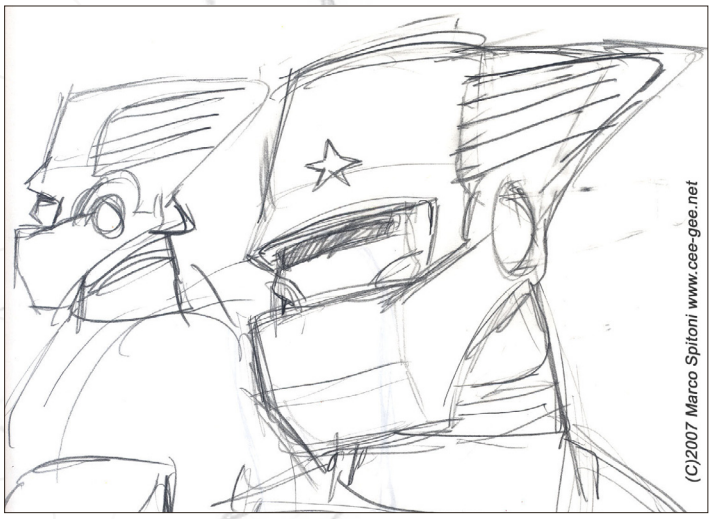
CODE . . . GUARDIAN

Hello Marco, before we get down to asking some interesting questions regarding your new animation, “Code Guardian”, could you tell our readers a bit about yourself, please?

Well, presently I’m work as Senior Lead Artist at a local videogame development studio, and I’ve been in this industry for about 13 years now. I came from a traditional art background after spending 4 years at Art school, and when I discovered the potential of 3D animation some years ago I was blown away by the possibilities. Since then, being a movie lover, I’ve started to work on my own productions, which is my passion. The first animation I created was a short called “Join The Empire!”, based on the Star Wars trilogy. It features, amongst the others, new spaceships and vehicles based on the concepts that I created. Since then, I’ve released “The Hunt”, and today, I can finally say that “Code Guardian” has been released as my latest project.

So with your passion for the movies and for creating them, why is it that you have not taken the leap and gone to work as a lead artist for a production company who deal with creating 3D visual effects for films?

That’s a question I’ve heard many times. Maybe it’s because I would like to direct more than simply leading a team of 3D artists. It’s not that easy to become a lead without having any real experience in the field, and you have to start being a “number” among several other artists before having enough experience. I’m not interested in making just one model or a very small part of a whole movie without being involved in the storytelling or direction.



After almost 5 years in the making, you finally released the finished version of your project “Code Guardian”. What sort of responses have you received after the first 24 hours of it going live on the Internet?

A lot of congratulations and appreciation, and that is extremely rewarding for me. I know that could sound maybe a bit cheesy, but getting the audiences appreciation is of great satisfaction. Of course some collaboration offers came in as well, but I’m already really busy - so busy in fact that I couldn’t afford to work on another professional project at this time.

So what does “Code Guardian” have in store for itself now that it’s complete?

“Code Guardian” has been created out of passion and it’s now a great chance for me to get more contacts and exposure. It’s going to be submitted at some movie festivals and events. I hope to gain some more interest for this project. I’ve already been in touch with some movie companies that are in some way interested in the idea behind it, and the way I’ve achieved the project. We’ll see, but usually when I finish one project I’m already thinking about the next one.



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Could you tell us a bit about the initial concept for the Guardians? What sort of research did you use to come up with them?

I've taken a huge amount of inspiration from a great animation movie called "The Iron Giant". The robot itself was such a good design; simple and 'retro' but with an original concept behind it - I was so intrigued by it. I then came up with the idea of a sort of sleeping guardian; a huge Russian robot guarding a tunnel entrance of the Trans-Siberian railway. At the beginning, the idea was just about a one-on-one fight between a 'Nazi' and a Russian robot, but I wasn't really satisfied with the action and screenplay. The set would have to be a natural landscape - mountains, snow, pine trees - nothing really interesting for a fight. So I then decided to introduce more depth to the story and to the action; enlarging the battle ground, adding more situations, etc. A fight in a 'Pearl Harbour' style setting would be much more exciting, with rich visuals and interesting situations, such as the P-51 sequence which took inspiration from the "King Kong" movie. Of course, I had to change the 'good' robot into a US army machine instead of it being a Russian one. Well, in the end, the project become larger and larger and it has been quite hard to reach the release date.

Could you tell us why you decided to introduce the Samurai Guardian at the end? Also with the final scenes, will there be a sequel to the animation?

I thought it was a good ending, showing that the fight wasn't really finished with the defeat of the Nazis. It was also very interesting to develop the design for it, and I especially like the rising sun flag on the back - it's like a medieval Samurai. With regards to a sequel, no, I honestly don't think I will do a sequel for this. Someone in the past asked me the same thing about "The Hunt". I do prefer to think about a totally new concept for the next short.

Could you tell us how you initially went about setting up the animation in the beginning? Did you work straight from concept sketches or did you go straight to story-boarding it?

I've made several different sketches for the robots, but the US robot was the most difficult to design. I knew what the Nazi robot had to look like, but I didn't have any clear ideas about the US robot. Along with those, I created story boards for each shot; they were extremely rough, I just needed something to give me a trace of what I was going to shoot. I also did a choreography sketch for the P-51 attack scene, with a top view of the entire harbour in order to decide the path for the planes and for the Nazi robot. That way I was able to keep control of the amount of buildings, objects and various other elements that I was going to see in each shot, depending on the area where the P-51 fighters were going to be at that time.

The camera work has been done really well, giving the whole animation a very dramatic and action-packed feel to it. Could you tell us how you went about achieving this?

Thanks! Well, there's no particular way I've achieved that. Like animation, this one is based on a "feeling" more than specific rules. However, I managed each shot as though they would have been shot by a real cameraman. On fast movements you can lose focus and target, and you can be shaken by detonations or huge vibrations. Camera work has been achieved with traditional key-frame animation considering these base rules.

Well I think you have succeeded in getting the right effect, as it works really well. Could you also tell us how you went about setting up the lights within the animation?

Some scenes do have more than 24 different lights, working with the simple scan-line render which requires you to simulate all the light bouncing and reflections using omni and directional lights. Usually there are directional lights with ray-casting, or area shadows for the sun, and omni's for the ambient and



reflections. Most scenes share the same lighting set, so in that case, it was of course a faster process to go through them.

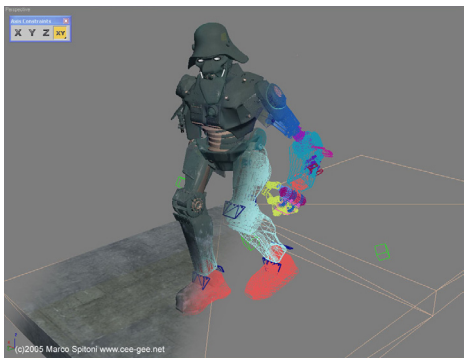
Code Guardian must have been a huge undertaking, and with such great artists as Alessandro Baldasseroni, Giovanni Bianchin, Iacopo Di Luigi, Alessandro Briglia, and of course yourself, how do you think the whole project went?

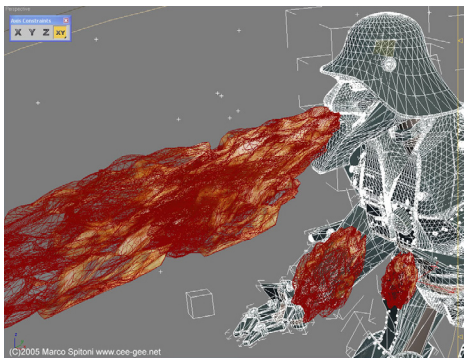
This has definitely been a huge effort - especially for me. But the support from all my fellow artists has been crucial; I couldn't have done this and have achieved such great results without their help. Alessandro did some great models and sets for the harbour, along with other stuff; Giovanni worked on the beautiful P-51 model and some other aeroplane models and he did a great job with the technical suggestions and various support.; Iacopo was crucial for the main human character sequences - I can say that the human touch of the movie was mostly done by him. Thanks must also go to the voice of Gery Van Landeghem. Last but not least, I must mention Alessandro Briglia, who worked on several characters who populate the harbour, and gave me great support throughout the whole production. I can say that the project went well, although it could have been done in a shorter time if this would have been a full-time project. The P-51 leader sequences gave us a few headaches, because it was the last thing left to do and Iacopo was on his first real animation task. But he did a great job anyway and we're quite proud of the results. Anyway, I'm not sure I will be able to face a project like this again - 13 minutes of CG animation is a lot of work and I don't want to get involved in something like this for another 5 years now! On the other hand, I know myself, and I could make the same mistake again.

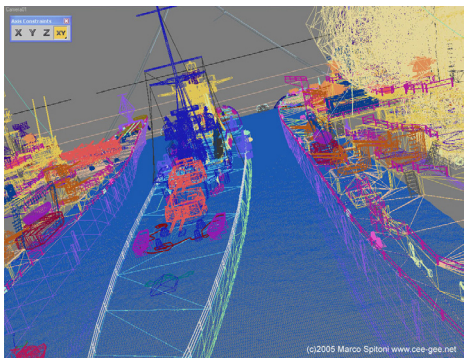
What do you think you have learnt from doing this project that you could take onto your next project?

Each time is a chance of improvement. "Code Guardian" is technically better than "The Hunt" and I hope I will have the same chance on the next project. It would be interesting to gain more knowledge about compositing in order to improve the pipeline and many other issues. I'm planning to find some extra time for that; I really would love to know more. I would also like to render it out in full HD, but for the moment I've seen that render time is a bit critical. I'm definitely going to need a more powerful machine and maybe more than one.

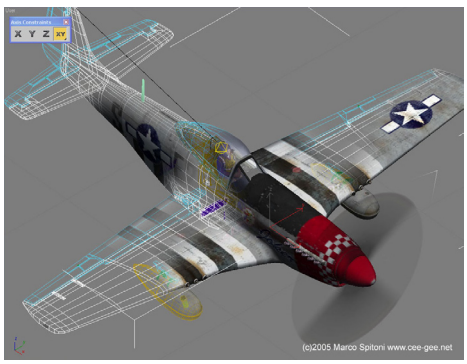


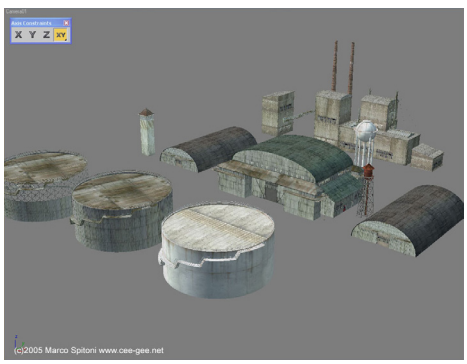

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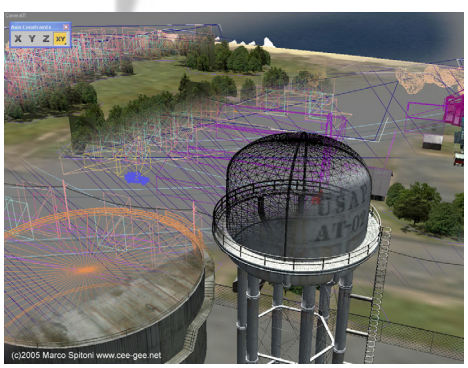

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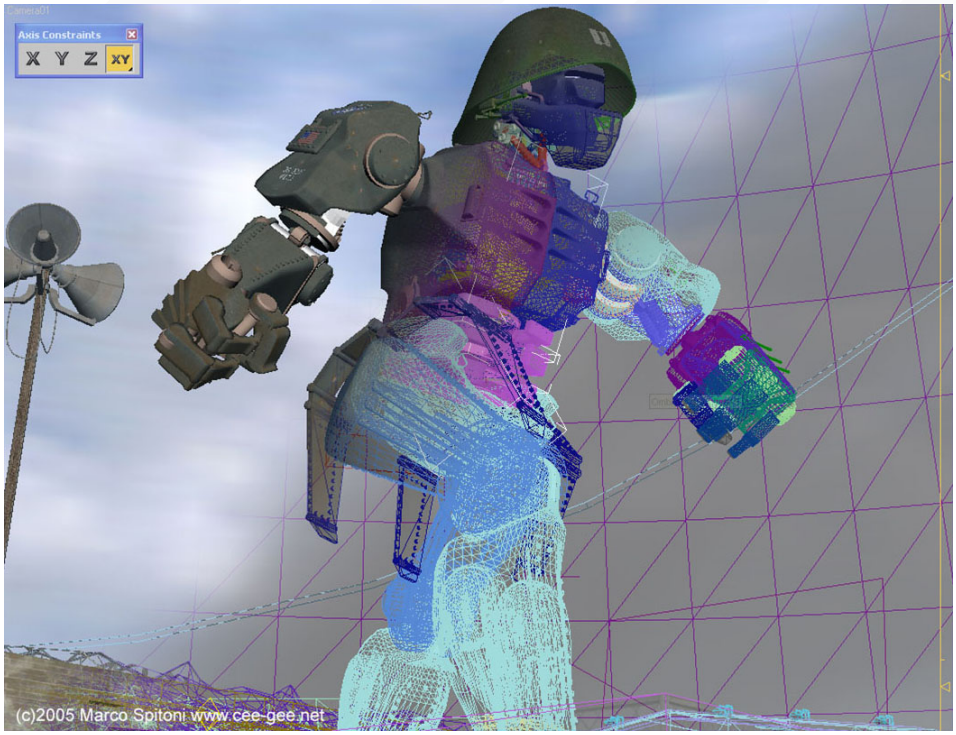

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What does the future have in store for you? Any more animations in the pipelines that you could let us in on, or are you planning a long holiday?
I really would love to get some time off... at this very time I'm trying to get some rest. But I'm still involved in some other business projects and further work at the videogame developing studio, so no time for holidays at the moment. By the way, I'm already thinking about another short movie project and this time I think I might take into consideration the making of a Fantasy theme movie. Too early for that though, but you'll find out more in the future from my website!

Well it has been a real pleasure talking with you about your animation. One last question before we finish: throughout your 3D career, what has been the most influential piece of advice that you have been given, and by whom?
Well, maybe from my father who's always telling me to learn more each time and to keep myself updated about my work and passion; I'm pretty lazy under that point of view and he's definitely right about that.



MARCO SPITONI

For more work by this artist please visit: www.cee-gee.net Or contact him at MSpitoni@cee-gee.net
Interviewed By : Christopher Perrins



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Lukas Jevcak

Pushing real-time 3D to a new visual level, 10TACLE STUDIOS are set to make their mark with their upcoming release “Elveon”. Lead Object artist, Lucas Jevcak, tells us more about 10TACLE STUDIO’s working practices and structure...

“Characters are a very important part of the game and the graphics. They contain very complex elements. We take it very seriously, from preparing the concept artwork all the way through to the final modelling, texturing and animation.”

Lukas Jevcak

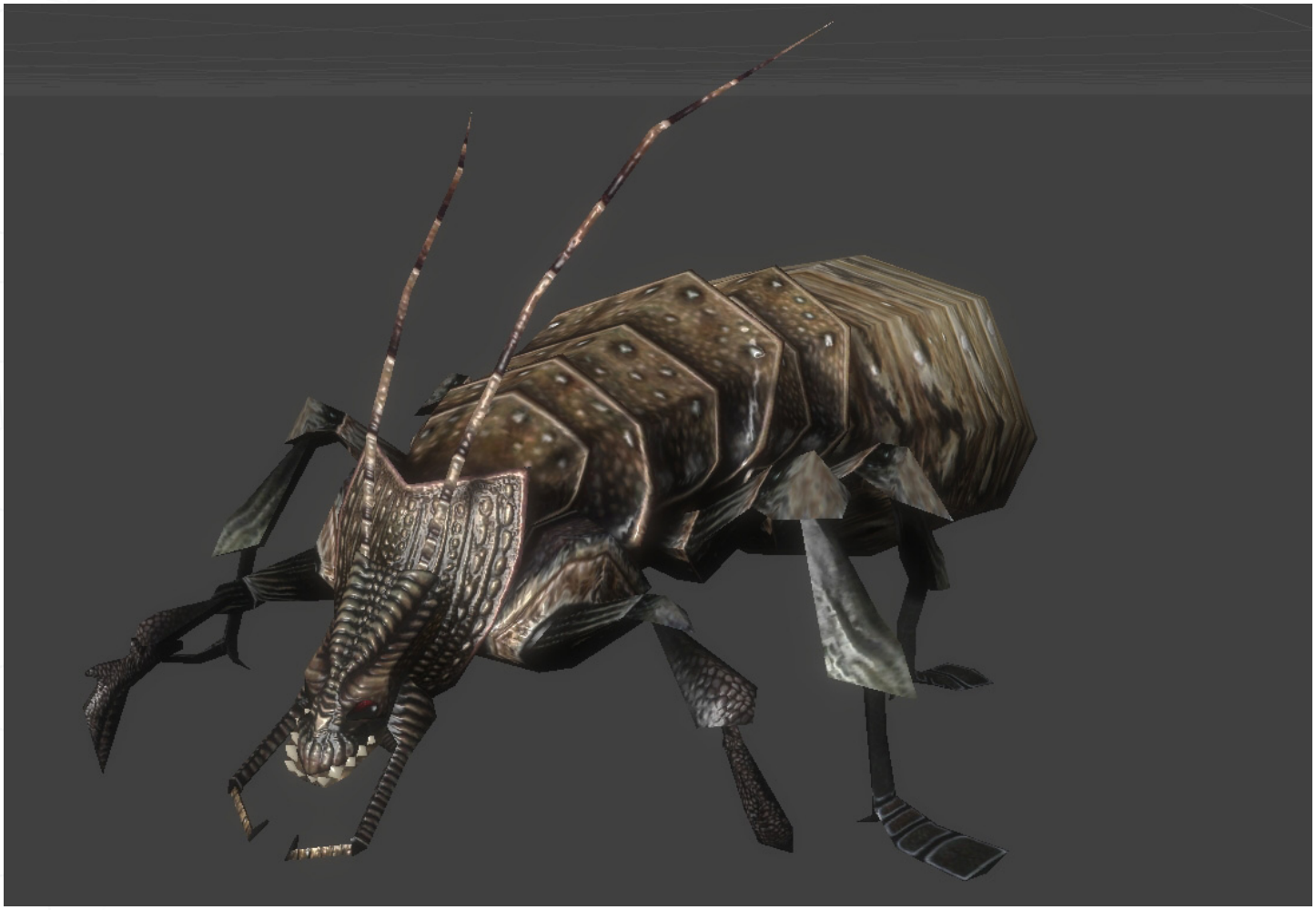
Hi Lucas, can you give the readers a brief introduction to your company, and the "Elveon" game project?

"10TACLE STUDIOS Slovakia" is based in Bratislava. The team's clear focus is to establish a new brand for fantasy games in the market, and to set new benchmarks in graphical and technical quality. Our current project, "Elveon", is positioned as an "Elvish Action Epic", and is already considered to be a new milestone for its genre. Elveon is the first game that focuses upon the Elvish culture. "Elveon" means "The Book of Elves", and is based on the comprehensive fantasy saga that reaches back to the ascendance of the elvish culture. The game will tell a story of Elvish heroes, situated in a world where divine powers and mystical creatures are still present, and play an active role in the events within the material world.

Wow, you have sold it to me already! When working on a fantasy project such as this, how do you research "Elvish Culture"? How much artistic license do you get; do you get to do what you want, or are you following a strict set of rules that have already been laid down for you by others?

Yes, our game designers researched 'Elvish Culture' in great detail. As I said before, Elveon is the first game that focuses on the Elvish culture and the Elvish world, and this is the most important fact for our game and our game designers. We are trying to create all of the graphics in one style - Elvish style - and I think that is our main 'rule'. But of course, we are still using our creativity, experience and so on, to create good, and nice, graphics.







How many people are there in your art team, and how does the structure of the team work?

We have more then 30 artists, architects, animators and designers in the team, and they are divided into four main departments: Character, Level, Animator, and Object. The Design department covers design, sketches and artwork for the rest of the art departments. The Character team work on player character and non-player character races, various creatures, and clothing and armour. The Level department is responsible for environments. Finally, the Object department provide the production of all props and objects, like furniture, statues, natural elements, and so on...



How many characters, objects, and so on, are planned to be created for the final Elveon? How many have you made so far?

We have made around 70 characters, creatures, monsters, gods and so on, all with equipment, amour, weapons, clothes, etc. We already have around 900 objects for all kinds of props, statues, furniture, doors etc.; each race in the game has its own architecture, culture and so on, which means that we created different styles of objects and props for each race. I don't know the final number of objects yet, but I am sure that it will be huge!







Does each team have a leader too? And how about the other end; do you have junior artists? Are you always on the look out to hire new talent to join the teams?

Yes, each team has a leader. I am working as Lead Object Artist. The Team Leader is responsible for all of the work that is done, or that needs to be done, in his department. Regarding junior artists, yes we like to give young artists a chance too, and of course, we are still looking for new talent to join our team.

Can you run us through the process of creating a main game character from scratch, from concept to testing?

The process of creating a main game character consists of a few main stages. The first step is the design, which is supplied by Design department, and they normally supply positioned sketches of a few different views. The next step is the skeleton, which is supplied by the Animation department. Then we need the model of the character. We make three stages: high-poly model, in-game model, and “Level Of Detail”. The next steps are the maps for the character (all types of maps, such as diffuse, normal, specular, alpha, and so on, are also supplied by the Characters department). The final step is the engine setup (setup materials, physics, cloth, hair and so on). The is a very short description for a long and hard process.



Yes I can imagine. Would you say that the characters are the most complex elements in Elveon?

Characters are a very important part of the game and the graphics. They contain very complex elements. We take it very seriously, from preparing the concept artwork all the way through to the final modelling, texturing and animation. We have really great character artists here. Most of the creatures shown in this interview were made by Tomas Flak and Michal Macak - they are really, very talented.







When you are not working, what do you like to do? Do these past-times aid your inspiration?

I like to play games and try to do some graphics in my own time, but to be honest, I want to spend as little 'free-time' with a computer or video games as possible. I like spending time with my girlfriend, or with my friends and colleagues in the pub. And regarding inspiration, I look for inspiration everywhere; on the streets, from movies, books or Internet - simply everywhere!

What are your future ambitions?

To make good games and better graphics; boost up the Slovak games community; do what I like, and be happy...









Lukas Jevcak

For more work by this artist please visit:

www.elveon.net

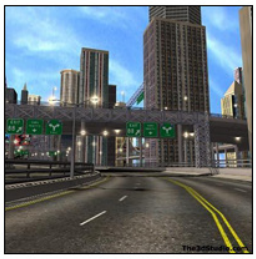
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INTERVIEW WITH

ALESSANDRO BALDASSERONI

From working in a tele-communication company, to freelancing for Blur Studios, we see how things are going for Alessandro...

ALESSANDRO BALDASSERONI



So, the usual question to start with… where did the 3D adventure start for you?

Well, I started more or less 10 years ago, employed as a CAD operator in a tele-communication company. So I started playing with the 3D functions of AutoCAD and I enjoyed it so much that I wanted to learn the fundamentals of 3D for myself. So I practised by myself with the early release of 3D Studio Max (1.0) and after a year I already had some kind of portfolio put together. In late 2000 I decided to make a living out of my passion for 3D art, and so I submitted my portfolio to Milestone (a game developer company), and luckily they hired me in charge of 3D artists.

You are currently working at Blur Studios: what a job!

Not exactly; I freelance from time to time for Blur Studios, and love it, but I'm still employed at Milestone S.R.L., a local video game developer here in Milan.

Can you tell us what you are currently working on? Or is it secret?...

No secret at all! I have various personal projects going on, all of which involve the making of 3D illustrations; I really want to push my illustrating techniques much further. I have this personal project of depicting "La disfida di barletta", which was a historical event which really happened in Italy in 1503. I want to represent the moment of the fight between Ettore Fieramosca and Guy la Motte. You can see some of the work in progress for this piece, here: http://lnx.eklettica.com/coppermine/thumbnails.php?album=95



In your career so far you have created characters, cars, artifacts, robots, scenes… Do any of these give you more joy, or do you just love the process of 3D creation?

Every model I have created since I started out, or at least the great majority of them, have been made with a precise purpose. I've always been more fascinated by the final result of modelling/texturing (which could be a cinematic or a still image), rather than the process itself. I love to contextualize things! Of course, I had to spend a lot of time (and still do) dealing with the technical aspects of computer graphics, but I love the artistic process underneath much more. To give you an example, I'm much more focused now on volumes, forms and colour schemes, compared to in the beginning when I was totally focused on topology and the cleanliness of my meshes (we love quads, and we hate tris) and complex

shaders. I guess it could be considered a natural evolution; you have to love the process and the technical aspects at first, because those are the fundaments with which you can free the 3D artist within. Then it's up to you to decide what you want to do. In my actual artistic phase I really do prefer using 3D for illustrating purposes, rather than photo-realistic usages, even if, from time to time, I'm commissioned to do cinematic models - that's probably the fine artist in me...



You have worked a lot on Marco Spitoni's 'Code: Guardian', what was that like?

It has been great seeing how much love and passion Marco poured into his short, and into those few models that I did for him. He had a strong vision about the overall feeling of his short since the very beginning, and modelling for him has been really pleasant and not constrictive at all, because he gave me complete artistic freedom… as always. There were almost no modifications once things were done (which happens very seldom working for my usual clients), because he knew that I would have given my best to do things right… and that's what should happen when things are made in people's spare time when they share a mutual passion and when no money at all is involved. We are buddies, we love CG, we loved this idea, and so we did it! He was also totally open to suggestions from the team (I asked him if it was a nice idea to put a cameo of the ark of the covenant into the short, and he was like, "Cool, why not?!". We are both lovers of Spielberg's movies and so we went with it. The same happened for the picture of an aviator's wife; I was supposed to do just a quick still image (a few frames), but I took it so seriously and enjoyed creating that old style of female face so much, that I decided to make a couple of high resolution rendered portraits, and luckily those renders have been featured in a lot of forums, which is great satisfaction, believe me. He' has been a great source of inspiration to me, which I can confess. Part of my popularity over the past few years has come from those



models, and I publicly thank him for allowing me to be a part of his awesome project - it will always remain a sweet memory of mine.

What has been your favourite project to date?

Well, from the motivational side of things, I guess everything I did for Code: Guardian has remained a favourite. From a personal point of view, I remember, with a lot of affection, His Majesty Vega. It was a great personal effort of mine from some time back. Recently, the marketing material of “Gun”, which I did for

Massive Black, has been really inspiring. I can also say the same for most of the things that I have done for Blur Studios - there are amazing talents there. Being part of their cinematics is quite satisfying!

Your Gun images are amongst some of my all-time favourites. How much creative freedom did you get with those?

They were done based on Massive Black concept sketches; they left me total freedom with regards to the texturing and the mood of the illustrations. For the image with the horse, Jason Manley was personally in charge of the art direction.

Do you have a personal dream project you would like to work on?

I would like to have a section of a gallery with some of my artwork hanging on the wall - this would satisfy my artistic ego. Personally, I would prefer not to confess my dream, so as not to bring it any back luck… I'm very sentimental.

A CG gallery! Good idea. I think that an exhibition of CG art in a gallery or museum may one day be a reality… Perhaps you should open one?

Well, I actually lack the right connections, and I guess a museum would be too much. I would just be happy with something a little more intimate.

What does a regular day involve for you?

My regular day involves working on low profiles, low poly models, compiling timesheets (luckily not that often), dealing with arrogant people (welcome to the industry), chatting with unknown people on MSN, going out from work and discovering to have collected a car ticket, eating tacos and drinking frozen margarita in a Mexican pub, watching TV, watching DVDs from time to time, going to bed anxious and waking up in the middle of the night all wet...

Ha ha! A very specific day for you then?! What do you like to do to relax/take time off?

It's weird because my hobbies are mainly visual art related, so after 8 hours at my current



boring job handling low poly stuff, I find myself modelling at home again, or doing personal illustrations. I like watching movies too - I have tonnes of DVDs, and I really love to eat and drink. I don't care much about the quality of these things in spite of the quantity. And sorry, I don't do any sports...



Do you have one piece of advice for any aspiring artists out there?

Follow your real passions from the beginning, if possible. Deal with compromises, but don't be enslaved by them. Watch paintings, collect comics and illustrations, and watch movies. If you have a good occasion, then take it immediately.



IN THE FLOATING



D R Y D O C K , J U N E `4 3

Thanks very much for talking to us Alessandro, and good luck for the future.

Thanks to you, 3DCreative, and a big “CIAO” to all the readers!

Alessandro Baldasseroni

For more work by this artist please visit:

www.eklettica.com

Or contact him at:

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Interviewed By: Ben Barnes

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Next Generation Games

KANE & LYNCH DEAD MEN™

In this chapter of our Next-Gen series, we talk to Sebastian Lindoff about the new wave of consoles now on sale. Plus we find out a little about a game that he's been working on: "Kane & Lynch: Dead Men"...

"Many consumers definitely define "next-gen" with realism. And they are absolutely hungry for it. The pitfall with these kinds of games is that it takes time... a lot of time. They need much more time for tech graphic artists to keep track on it."

Io-Interactive

KANE & LYNCH DEAD MEN

How have the new generation of consoles changed the approach to game design?
The biggest thing that changed our approach wasn't the new consoles themselves, but it was leaving the old ones behind. That suddenly changed how we could design the games. For example, we didn't have to let go of certain levels/features because they wouldn't run that well on a PS2, even if they worked out fine on a PC. The PC, 360 and PS3 are actually quite close to each other when it comes to what they can deliver. The Wii on the other hand has really changed the approach a lot; not only on how we design the game based on all the cool ways you can use the Wiimote, but also how to distribute the functionality on the buttons, because there are quite few buttons compared to the controllers that we're all used to.

What differences in studio / team-size / budget / development time, does next generation game development bring? Both budget and development time can't really be changed, as they go somewhat hand in hand. Time, cost and money are not something we suddenly get more of just because there are new consoles released - I wish it was that easy! When it comes to team-size, we understood that it was going to take longer to develop a game because of the new technology and all of the "fancy-pancy" stuff that everyone needs to keep a track on. So we've started out-sourcing a lot more. Some projects use more, and some less, but before we didn't use that at all.

How much more freedom has been awarded to the artists in terms of texture memory and poly counts? This goes only for the PC, 360 and PS3. When it comes to textures I can't really say that it changed very much. Firstly, everybody went: "Finally, now we can make tons of custom textures". Well we quickly found out that the problem is very different. Textures are still the part of the graphics that take up the most memory, but this time it was also about avoiding long loading times. Therefore it's more a question of bigger resolution and slightly more custom textures, because you quickly fill up the memory with all of the extra bump, normal, specular, and reflection maps, and so on. The poly count is something that we can crank up a little more, but not that much, because the new expensive shaders/lighting technology is really having a huge impact on the frame rate. And with these new shaders, in many cases we don't need to add more polygons.







In what areas do you feel there have been major advances made over the XBOX and PS2?

We introduced a crowd system in “Hitman: Bloodmoney” that ran on the PS2. This changed things a lot for us, both in terms of how the crowd reacts in different scenarios and how the player interacts with the crowd. We also implemented Havok, and replaced that with the physics code we used in past projects. It works so much better with physics now on these new machines. The main engine is mostly a modified Hitman engine. The light code is



still the same, and we use vertex lighting and not “perpixel” lighting. We thought about how we could improve the light model in the engine and decided to add Ambient Occlusion which makes a huge difference on the environments. Other than that it’s general improvements such as more memory, bigger and better resolution on textures, more bones in characters, more polygons, more expensive shaders, and so on.

Which consoles will you be supporting: PS3 / Wii / XBOX 360?

All three of them.

There are many that maintain the argument that current consoles continually improve the graphical appearance of games, but do not necessarily develop better game play. What is your stance on this? Both elements are really important. But I can tell you this: if you make a game with no new game play elements then you really need to make it good-looking! No, but seriously, I don’t think a game necessarily needs to have new game play elements. Take a game like “Lost Planet” for example. That game in my eyes doesn’t have any special new game play, it’s just an ordinary shooter. But it’s a good ordinary shooter; It’s entertaining to play, and it has a really nice atmosphere too. But I think there are a lot of cases where perhaps some developers put too



much focus upon making it look nice and forget about the game play - it seems like they think that's what's important. Obviously we are aiming for both.

What next-gen titles are you currently working on? We're currently working on the game "Kane & Lynch: Dead Men" for the XBOX 360 and PC games for Windows. This will release later this year. Kane & Lynch is a new IP developed that we're all really excited about - it's a character-driven third person action shooter game. You can view a trailer here: **http://www.kaneandlynch.com**

What software was used to create this/these game(s)? And what features did you work with the most? In the case of both the crowd system and the regular AI, we used our in-house engine, Glacier. No Autodesk products were used for this task. However, we have used Autodesk's 3DS Max for creating 90% of all the 3D graphics in the game: characters, environments, vehicles, weapons, and so on.

Many games seem to be striving towards more and more realism, in terms of texturing and lighting for example, as well as more convincing character models. Do you feel this is something consumers seem hungry for, and what do you



foresee the pitfalls inherent in this approach may be?

Many consumers definitely define “next-gen” with realism. And they are absolutely hungry for it. The pitfall with these kinds of games is that it takes time... a lot of time. They need much more time for tech graphic artists to keep track on it. Realism also includes normal mapped textures, which have been created from hi-res models. This takes time and suddenly demands more skills from the artists. And by just doing a realistic-looking game it’s easy for a consumer to be critical about it because they have so much to relate to around them, so if it’s not done well they will notice it.

Artificial Intelligence is quite often regarded as the ‘holy grail’ of game development. In what ways are the next generation consoles helping unravel this very elusive element? You have more memory to fill up AI’s behaviour with, which obviously adds more for game play and mood. Especially for games like Hitman where your game play is a lot about your integration with the AI. Then in games like Kane & Lynch we have Co-op which really benefits from this. If you want to make a really good Co-op feature

SEBASTIAN LINDOFF
IO INTERACTIVE
For more information please visit: www.ioi.dk
Or contact: sebastian.lindoff@ioi.dk.
For information about Kane & Lynch: Dead Men' please visit:
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then you need to feel that you can rely on your AI. I know I've been swearing tons about AI, but these new machines allow us to make them way more advanced than we're used to. Even if we were using crowd on the PS2 it's something we can make much more realistic when it comes to response and integration with the player, and so on.

In this time of constant sequels to 'big name' games, what importance is given to developing your own game IP for next generation consoles rather than relying on licenses? I think that if you have a successful IP it's way more attractive than a license game. It's also a lot more fun for the studio to work on "your own game" - you feel more proud about it. It can be somewhat easier for you to put your soul into it when it's your own. If you look at the most successful titles they are not licensed games.

Thanks very much for talking to us and good luck for the future.

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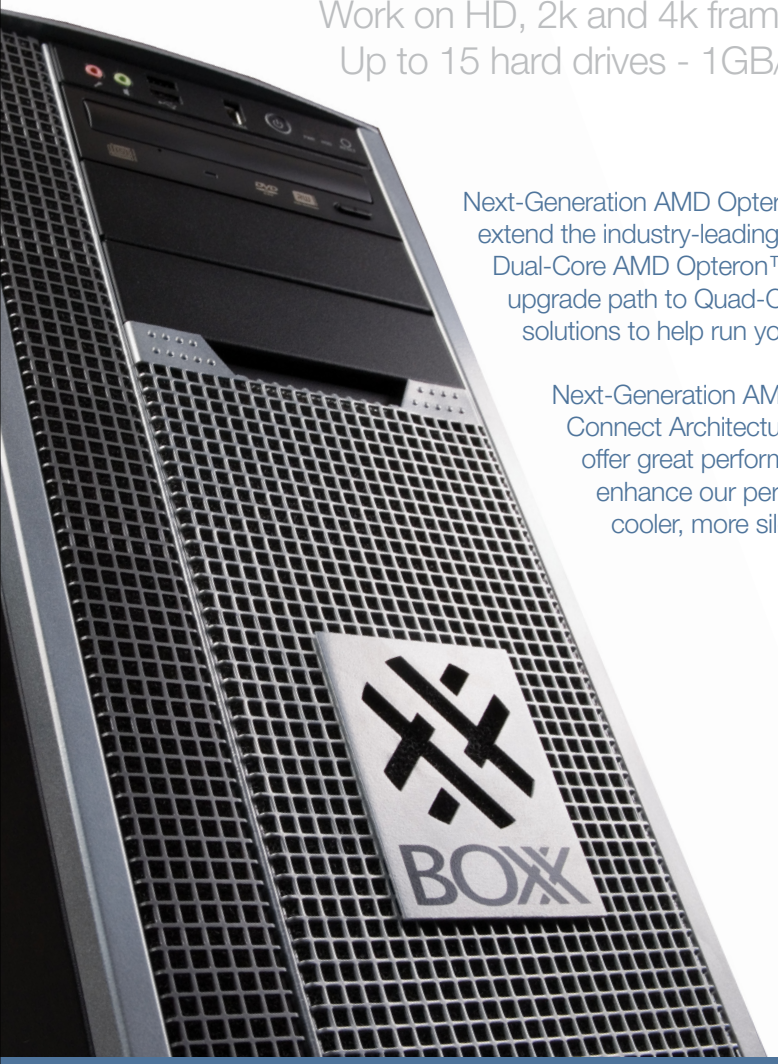
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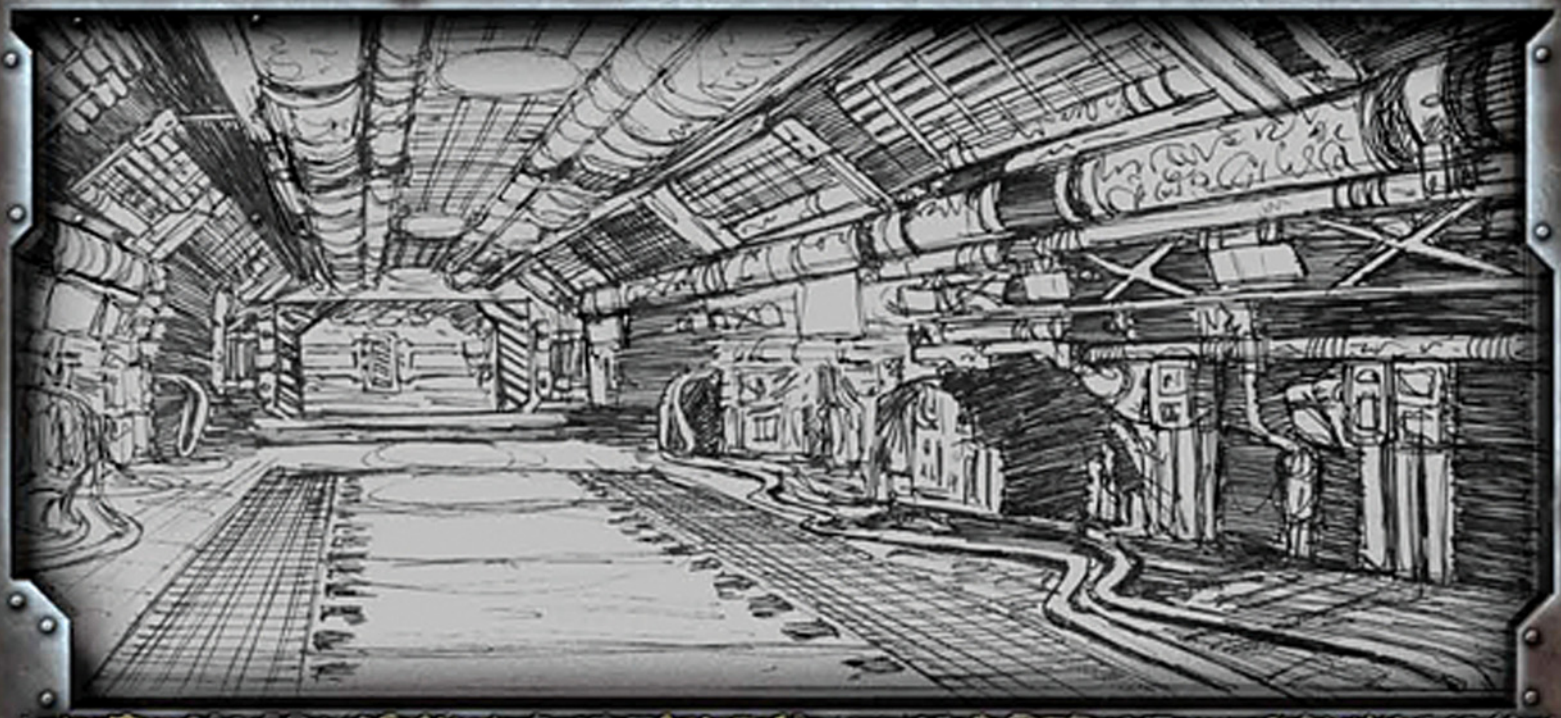
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A Basic (Game) Art EDUCTION

Is an excerpt from 3D Game Textures. Ever wanted to see the basics behind game art? Would you like to see the world as an artist does? If so, then the following pages are definitely for you! A Basic (Game) Art Education takes us through the process of creating great textures for games...

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A Basic (game) Art Eduction

Introduction

The basis of computer art is art itself, so before we dive into any technical issues we must first discuss the most basic yet most important aspects of visual art. While teaching you traditional fine art skills is beyond the scope of this book, it is critical to have an understanding of some basic aspects of visual art in order to create game textures. Fortunately, these basic aspects of art are fairly easy to present in book form. By studying these basics of art, you will learn to see the world as an artist does, understand what you see, and then be more able to create a texture set for a game world.

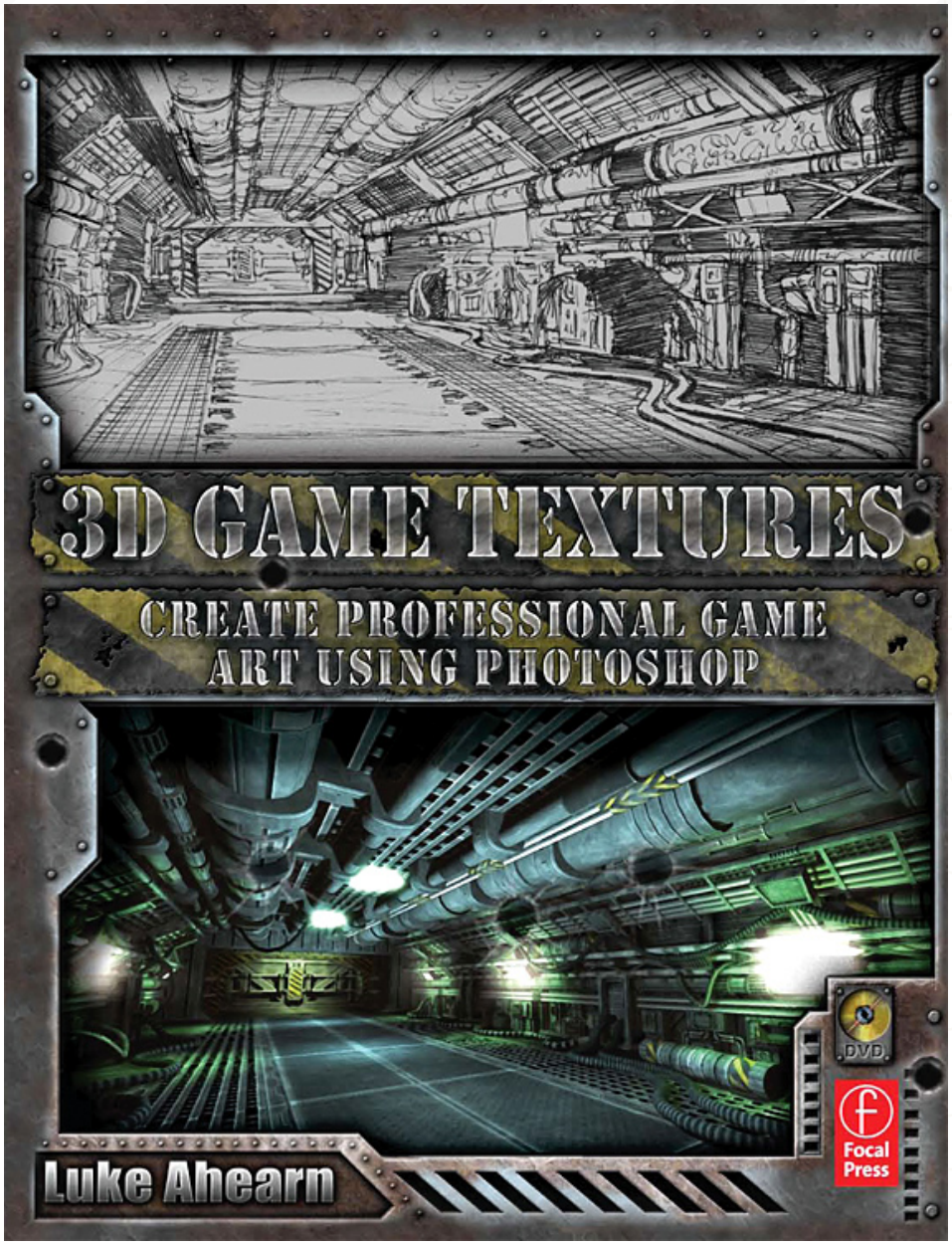
"Art is born of the observation and investigation of nature".

Cicero, Roman author, orator, and politician (106 BC–43 BC)

The basic aspects of visual art we will focus on are:

- Shape and form
- Light and shadow
- Texture
- Color
- Perspective

Learning to observe the basic visual aspects of the world around you is a strong beginning in the process of seeing the world like an artist, communicating with other artists, and creating great game textures. Technology is, of course, critical to the larger picture of game textures, but the actual basics of art is where great textures begin. Too often would-be game artists are thrown into a discussion on tiling, or even game engine technology, when what is most important for the creation of game textures is the ability to understand what you are seeing in the real world and to recreate it on the computer. Often



a texture artist is required to break a scene down to its core materials and build a texture set based on those materials, so learning this ability is essential. While you don't need to have an advanced degree in art to create great textures, let's face it: almost anyone can learn what buttons to push in Photoshop, but the person who understands and skillfully applies the basics of art can make a texture that stands out above the rest.

There are many types of art and aspects of visual art that you should further explore in order to develop as a game artist. Some of the things you can study and/or practice are:

- Figure drawing
- Still-life drawing
- Photography
- Painting (oil, watercolor, etc.)
- Lighting (for film, still photography, the stage, or CG)
- Color theory and application
- Sculpture •Drafting and architectural rendering
- Anatomy
- Set design

It is even worth the time to study other areas of interest beyond art including science, particularly the behavior of the physical world. Light, for example, is becoming processed more

and more in real time and not painted into the texture to the extent it was just a few years ago. The more you understand and are able to reproduce effects such as reflection, refraction, blowing smoke, etc., the more success you will find as a game artist. We presently have emerging technologies that reproduce the real world to a much greater extent than ever before, but it still takes an artist to create the input and adjust the output for these effects to look their best. The areas of study that will help you when dealing with real-world behaviors are endless. You can start by simply observing the world, how water drips or flows, the variations of light and shadow on different surfaces at different times of the day, how a tree grows from the ground. Straight like a young pine or flared at the base like an old oak—you will soon be staring at the cracks in the pavement and photographing the side of a dumpster while the world stares at you. An excellent book for this type of activity is **Digital Texturing & Painting** by Owen Demers. You can also take tours of museums, architectural tours, nature walks; join a photography club, or a figure drawing class ... there is no end to the classes, clubs, disciplines, and other situations you can expose yourself to that will open up your mind to new inspirations and teach you new tools and techniques for texture creation. And, of course, playing games, watching movies, and reading graphic novels are the food of the game artist.

Chapter Overview

- Shape (2D) and Form (3D)
- Light and Shadow
- Texture: tactile vs. visual
- Color
- Perspective

While there are many elements of traditional art, we will narrow our focus to those elements that are most pertinent to texture creation. We will start with shape and form.

Shape and Form

A **shape** is simply a two-dimensional (height and width) outline of a form. A circle, square, rectangle, and triangle are all examples of shape. Shape is what we first use to draw a picture before we understand such concepts as light, shadow, and depth. As children we draw what we see in a crude way. Look at the drawings of very young children and you will see that they are almost always composed of pure basic shapes: triangle roof, square door, circle sun. Even as adults, when we understand shadows and perspective, we have trouble drawing what we see before us and instead rely on a whole series of mental notes and assumptions as to what we think we are seeing. There are exercises to help develop the ability to draw what we actually see. Most notably, the book **Drawing on the Right Side of the Brain** offers many such exercises.

One of the most famous of these exercises involves the drawing of a human face from a photo. After you have done this, you then turn the photo upside down and draw it again. The upside-down results are often far better than the right-side up, first try. This is due to the fact that once you turn the image upside down your brain is no longer able to make any mental assumptions about what you think you are seeing; you can only see what's really there. Your brain hasn't yet developed a set of rules and assumptions about the uncommon sight of an upside-down human face. One of the first skills you can practice as an artist is trying to see the shapes that make up the objects that surround you. Figure 1-1 has some examples of this ranging from the simple to the complex. This is a very important skill to acquire. As a texture artist you will often need to see an object's fundamental shape amidst all the clutter and confusion in a scene so you can create the 2D art that goes over the 3D objects of the world.

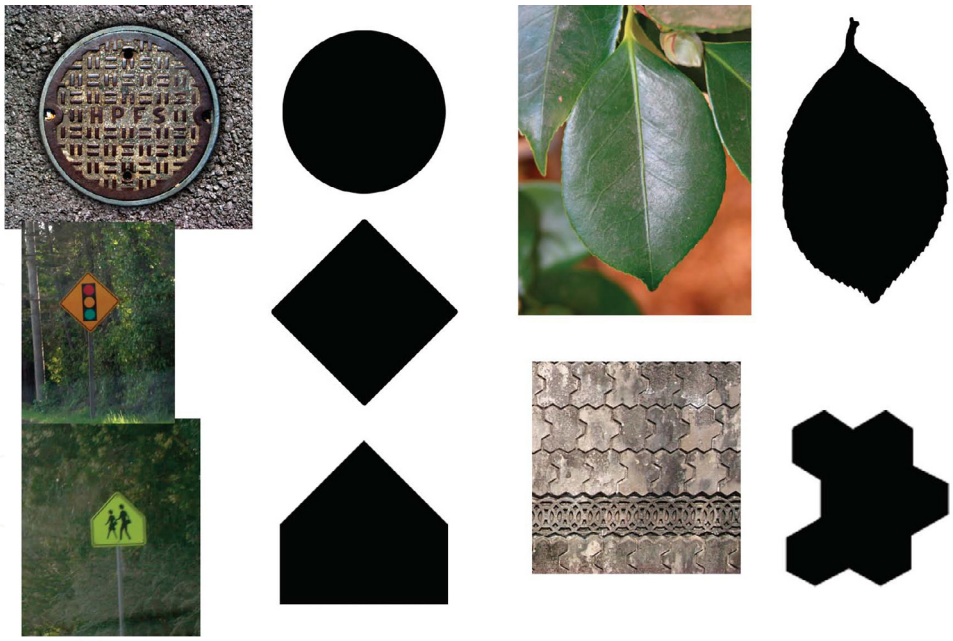


Figure 1-1 Here are some examples of shapes that compose everyday objects. These shapes range from simple to complex.

Form is three-dimensional (height, width, and depth) and includes simple objects like spheres, cubes, and pyramids. See Figure 1-2 for examples and visual comparisons. You will see later that as a texture artist you are creating art on flat shapes (essentially squares and rectangles) that are later placed on the surfaces of forms. An example can be seen in Figure 1-3 as a cube is turned into a crate (a common prop in many computer games). When a shape is cut into a base material in Photoshop and some highlights and shadows are added, the illusion of form is created. A texture can be created rather quickly using this method. See

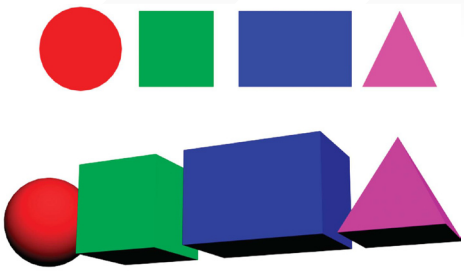


Figure 1-2 Here are examples of shapes and forms. Notice how it is only shadow that turns a circle into a sphere.

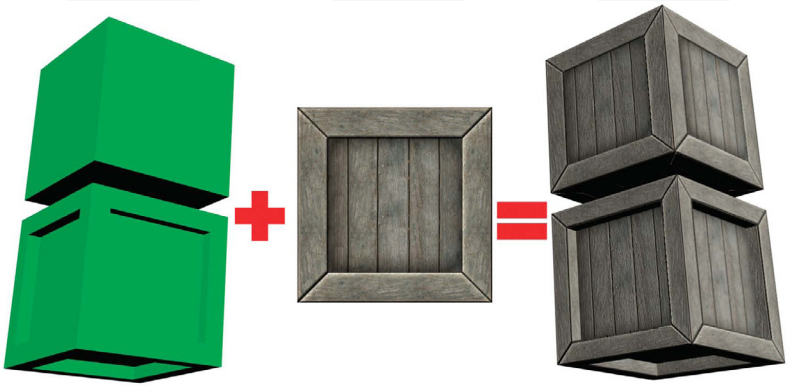


Figure 1-3 A game texture is basically a 2D image applied, or mapped, to a 3D shape to add visual detail. In this example a cube is turned into a crate using texture. And a more complex 3D shape makes a more interesting crate while using the same 2D image.

Figure 1-4 for a very simple example of a space door created using an image of rust, some basic shapes, and some standard Photoshop Layer Effects.

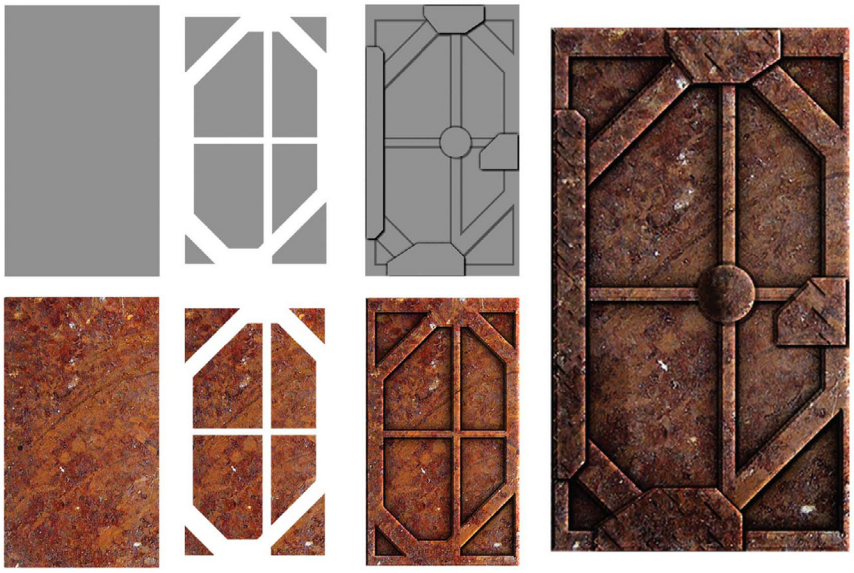


Figure 1-4 Here is an example of how shapes can be cut into an image and using some simple layer effects can then be turned into a texture in Photoshop.

Of course, mapping those textures to more complex shapes like weapons, vehicles, and characters gets more complex, and the textures themselves reflect this complexity. Paradoxically, as the speed, quality, and the complexity of game technology increase, artists are actually producing more simplified textures in some cases. The complexity comes in the understanding and implementation of the technology. Don't worry—you will gradually be introduced to this complexity until it culminates with the sections on Shader Technology. As in the above section, you can practice looking for the forms that make up the objects around you. In Figure 1-5 you can see some examples of this.

Light and Shadow

Of all the topics in traditional art, this is arguably the most important due to its difficulty to master and its importance to the final work. Light and shadow give depth to and, as a result, define what we see. At its simplest, light and shadow are easy to see and understand. Most of us are familiar with shadow; our own shadow cast by the sun, making animal silhouettes with our hands on the wall, or a single light source shining on a sphere and the round shadow that it casts. That's where this book will start. Light and shadow quickly get more complicated, and



Figure 1-5 Here are some examples of the forms that make up the objects around you.



Figure 1-6 Here is the same door texture from the previous section. Notice the complete lack of depth as we look at it from angles other than straight on. The illusion of depth is shattered.





Figure 1-7 The crate on the left has conflicting light sources. The shadow from the edge of the crate is coming up from the bottom, is too dark, is too long, and even has a gap in it. The highlights on the edges are in conflict with the shadow cast on the inner panel of the crate, and they are too hot, or bright. The crate on the right has a more subtle, low-contrast, and diffuse highlight and shadow scheme and will work better in more diverse situations.

the examples in this book will get more complex as well. The book [3D Game Textures] will start with the ability to see and analyze light and shadow in this chapter, move up to creating and tweaking light and shadow in Photoshop using Layer Styles for the most part, and finally look at some basic hand tweaking of light and shadow. If you desire to master the ability to hand paint light and shadow on complex and organic surfaces, then you are advised to take traditional art classes in illustration, sketching, and painting.

We all know that the absence of light is darkness, and in total darkness we can obviously see nothing at all, but the presence of too much light will also make it difficult to see. Too much light blows away shadow and removes depth and desaturates color. In the previous section we looked at how shape and form differ. We see that difference primarily as light and shadow as in the example of the circle and a sphere. But even if the sphere were lit evenly with no shadows and looked just like the circle, the difference would become apparent when rotated around the vertical axis. The sphere would always look round if rotated, whereas once you began to rotate the circle it would begin to look like an oval until it eventually disappeared when completely sideways. In the previous example, where a shape was cut into an image of rusted metal and made to look like a metal space door using Photoshop Layer Effects, the highlights and shadows were faked using the various tools and their settings. In Figure 1-6 you can see the same door texture rotated from front to side. Notice the complete lack of depth in the image on the far right. The illusion is shattered.

Understanding light and shadow are very important in the process of creating quality textures. We will go into more depth on this topic as we work through this book [3D Game Textures]. One of the main reasons for dwelling on the topic is not only due to the importance of light and shadow visually, but you will see that

many of the decisions that need to be made are based on whether light and shadow should be represented using texture, geometry, or technology. To make this decision intelligently in a serious game production involves the input and expertise of many people. While what looks best is ideally the first priority, what runs best on the target computer is usually what the decision boils down to. So keep in mind that in game development you don't want to make any assumptions about light and shadows—ask questions. We cover different scenarios of how light and shadow may be handled in a game in this book [3D Game Textures]. It can be challenging to make shadows look good in any one of the situations. Too little and you lack depth, too much and the texture starts to look flat. Making shadows too long or intense is an easy mistake. And unless the game level specifically calls for that, on rare occasion, don't do it. Technology sometimes handles the highlights and shadows. This is challenging because it is a new way of thinking that baffles many people who are not familiar with computer graphics. This method can also be a bit overwhelming because you go from creating one texture for a surface to creating three or more textures that all work together on one surface.

Naming and storing those textures can get confusing if you let it get away from you.

Overall you want your textures to be as versatile as possible, and that includes, to a great degree, the ability to use those textures under various lighting conditions. See Figure 1-7 for an example of a texture where the shadows and highlights have been improperly implemented and one that has been correctly created. For this reason we will purposely use highlight and shadow to a minimalist amount. You will find that if you need more depth in your texture than a modest amount of highlight and/or shadow, then you most likely need to create geometry or use a shader—or consider removing the source of shadow! If there is no need for a large electrical box on a wall, then don't paint it in if it draws attention to itself and looks flat. If there is a need and you are creating deep and harsh shadows because of it, you may need to create the geometry for the protruding element. You may find that as game development technology accelerates, things like pipes, door knobs, and ledges are no longer painted into the texture but modeled in geometry. Many texture surface properties are no longer painted on. Reflections, specular highlights, bump mapping, and other aspects of highlight and shadow are now processed in real time.



Figure 1-8 Here is a REALLY BAD texture created from two sources. Notice the difference in the shadows and highlights. The human eye can detect these errors even if the human seeing it can't understand why the image looks wrong.

In the rest of this book [3D Game Textures] we will take various approaches to light and shadow using both Photoshop's Layer Effects to automate this process and other tools to hand paint highlights and shadows. One of the main benefits to creating your own highlights and shadows in your textures is that you can control them and make them more interesting as well as consistent. Nothing is worse than a texture with shadows from conflicting light sources; harsh, short shadows on some elements of the texture and longer, more diffuse shadows on others. See Figure 1-8 for an example of this. The human eye can detect these types of errors even if the human seeing it can't quite understand why the image looks wrong. One of the artist's greatest abilities is not only being able to create art, but also being able to consciously know and verbalize what he is seeing. In Figure 1-9 you can see the various types of shadows created as the light source changes. This is a simple demonstration. If you ever have the opportunity to light a 3D scene

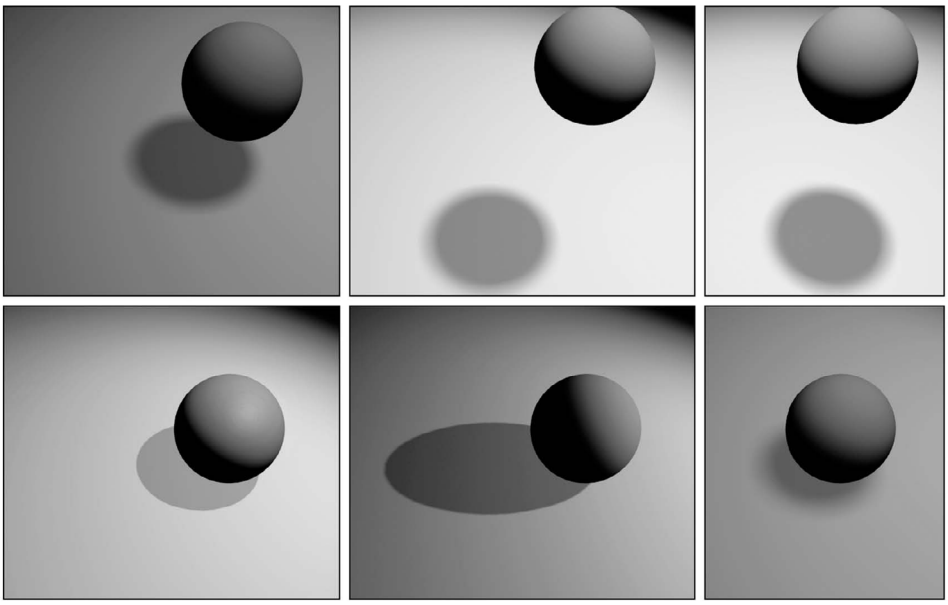


Figure 1-9 With one light source and a simple object you can see the range of shadows we can create. Each shadow tells us information about the object and the light source, such as location, intensity, etc.

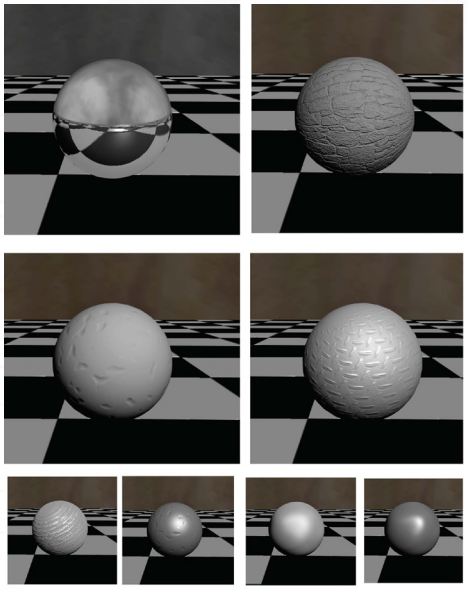


Figure 1-10 With one light source and a simple object with various highlights on it, you can see that the object appears to be created of various materials. Keep in mind that what you are seeing is only highlight and shadow. How much does only this aspect of an image tell you about the material?

or movie set, you will discover that the range of variables for light and shadow can be quite large.

Highlights also tell us a good bit about the light source as well as the object itself. In Figure 1-10 you can see another simple illustration of how different materials will have different highlight patterns and intensities. These materials lack any texture or color and simply show the highlights and shadows created on the surface by one consistent light source.

For a more advanced and in-depth discussion on the subject of light and shadow for 3D scenes, I recommend **Essential CG Lighting Techniques** by Darren Brooker.

Texture

In the bulk of this book [3D Game Texture], as in the game industry, we will be using the term "texture" to mean a 2D static image. What we refer to as textures in this book are also sometimes called materials, or even tile sets (from older games), but we will stick to the term texture. The one exception in this book is that in this section we will talk about the word texture as it is used in traditional art: painting, sculpture, etc. A side note on vocabulary: keep in mind that vocabulary is very important and can be a confusing aspect of working in the game industry. There is much room for miscommunication. Different words can often mean the same thing, and the same words can often mean many different things. Acronyms can be especially confusing; RAM, POV, MMO and RPG all mean different things in different industries. POV means point-of-view in the game industry and personally-owned vehicle in the government and also stands for persistence of vision. So to clarify, the term "texture," while usually meaning a 2D image applied to a polygon (the face of a 3D object), in this section of this chapter it will refer to an aspect of an image and not the image itself. We draw this distinction for the following conversation on traditional art.

In traditional art there are two types of texture: tactile and visual.

Tactile texture is when you are able to actually touch the physical texture of the art or object. Smooth and cold (marble, polished metal, glass) is as much a texture as coarse and rough. In art this applies to sculptures and the like, but many paintings have thick and very pronounced brush or palette knife strokes. Vincent Van Gogh was famous for doing this. Some painters even add materials to their paint like sand to add more physical or tactile texture to their work.

Visual texture is the illusion of what the surface's texture might feel like if we could touch it. Visual texture is composed of fine

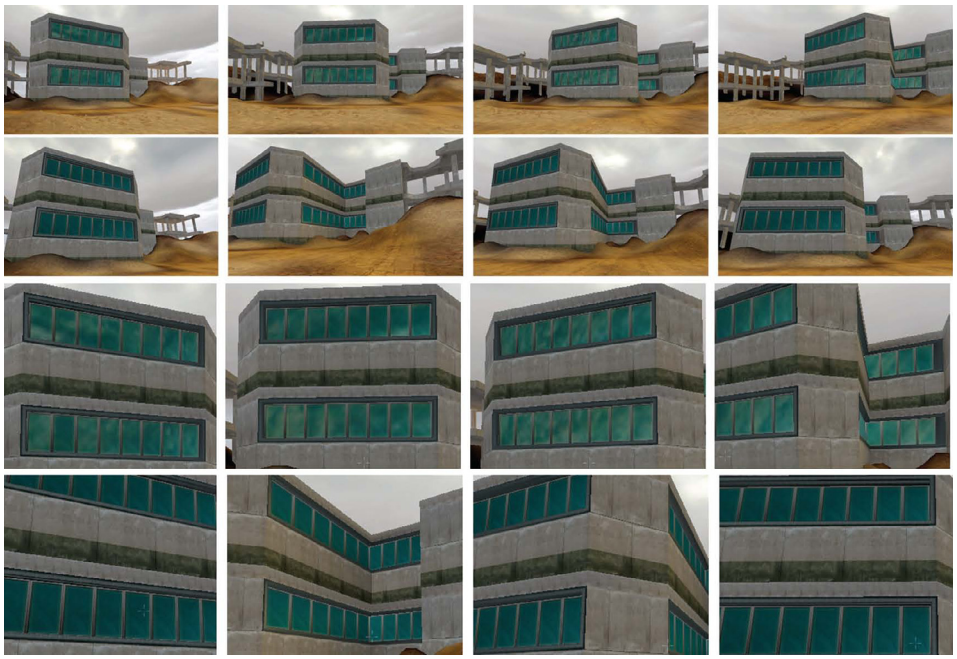


Figure 1-11 Visual texture is composed of fine highlights and shadows. A shader allows for the real-time processing of visual texture, among other effects, and adds much more realism to a scene as the surface reacts with the world around it. In this example I used a specular map. These effects are best seen in 3D, but you can see here that the windows in the building on the top row have a reflection of the sky in them and that reflection moves as the players does. The windows in the building on the lower row are painted textures and stay the same no matter where the player walks. The bottom two rows are close-ups to help you see the effect. If you pick one window in the close-up images and look closely, you will see that the cloud reflections are in different places in each frame.

highlights and shadows. As computer game texture artists, we deal solely with this aspect of texture. So, for example, an image on your monitor may look like rough stone, smooth metal, or even a beautiful woman and if you try and kiss that beautiful woman she is still just a monitor—not that I have ever tried that, mind you.

There are many ways to convey texture in a two-dimensional piece of art. In computer games we are combining 2D and 3D elements and must often decide which to use. With 2D we are almost always forced to use strictly 2D imagery for fine visual texture. And while the faster processors, larger quantities of RAM, and the latest crop of 3D graphic cards allow us to use larger and more detailed textures and more geometry, a great deal of visual texture is still static, and noticeably so to a trained artist. This limitation is starting to melt away as complex Shader Systems are coming into the mainstream of real-time games. The real-time processing of bump maps, specular highlights, and a long list of other more complex effects are adding a depth of realism to our game worlds not even dreamed of in the recent past. This book [3D Game Textures] will teach you both the current method of building texture sets and the ever-increasing method of building material sets that use textures and shader effects together. We will discuss this more at length later in the book, but for now you can see some visual examples of these effects. In Figure 1-11 you can see how in the 2D strip the object rotates but the effects stay static on the surface, while on the 3D strip the object rotates and the effect moves realistically across the surface.

The game artist's job is often considering what tools and techniques we have at our disposal and choosing which best accomplishes the job. We are often trading off between what looks good and what runs well. As you begin to paint textures, you will find that some of the techniques of traditional art don't work in the context of game texturing. As a traditional artist we usually do a painting that represents one static viewpoint, and we can paint into it strong light sources and a great deal of depth, but that amount of depth representation goes beyond tactile texture and becomes faked geometry and looks flat in a dynamic, real-time 3D world. As mentioned earlier in this chapter, this will not work in a 3D game where a player can move about and examine the texture. Once again we must choose what to represent using a static 2D image, what can be processed in real time using a shader, and what must be represented using actual geometry. There are many solutions for this problem; among them are restricting the players' ability to move around the texture, removing the element of overt depth representation, or adding actual geometry for the parts of the texture represented by the overt depth representation (see Figure 1-12).

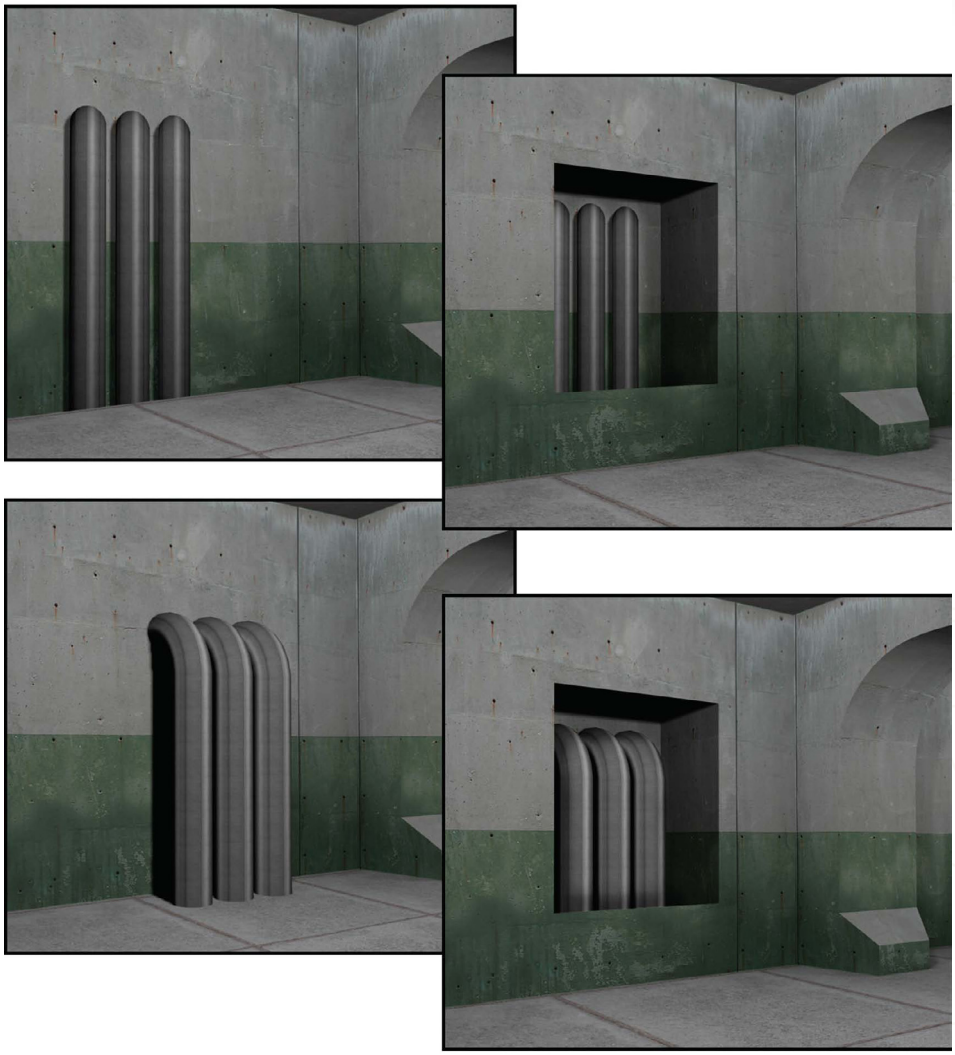


Figure 1-12 There are several possibilities when dealing with overt depth representation. Upper left: the pipes are painted into the texture and totally lack any depth; notice how they dead end into the floor. Upper right: restricting the players' ability to move around the texture can alleviate some of the problem. Lower left: adding actual geometry for the parts of the texture that cause the overt depth is the best solution if possible (this method uses less texture memory but more polygons). Finally, lower right: adding the actual geometry into the recess is an option that looks pretty interesting and actually allows for a reduction of geometry. The removal of polygons from the backsides of the pipes more than offsets the added faces of the recess.

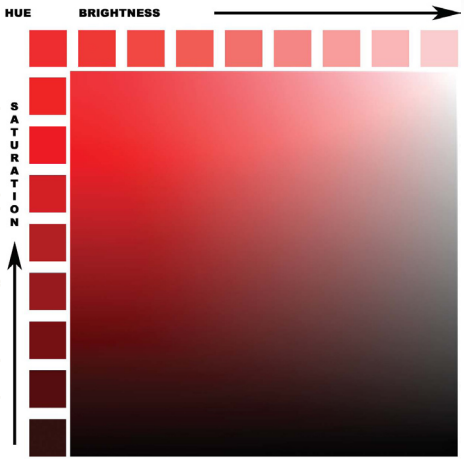


Figure 1-13 In this image you can see a representation of HSB—Hue, Saturation, and Brightness.

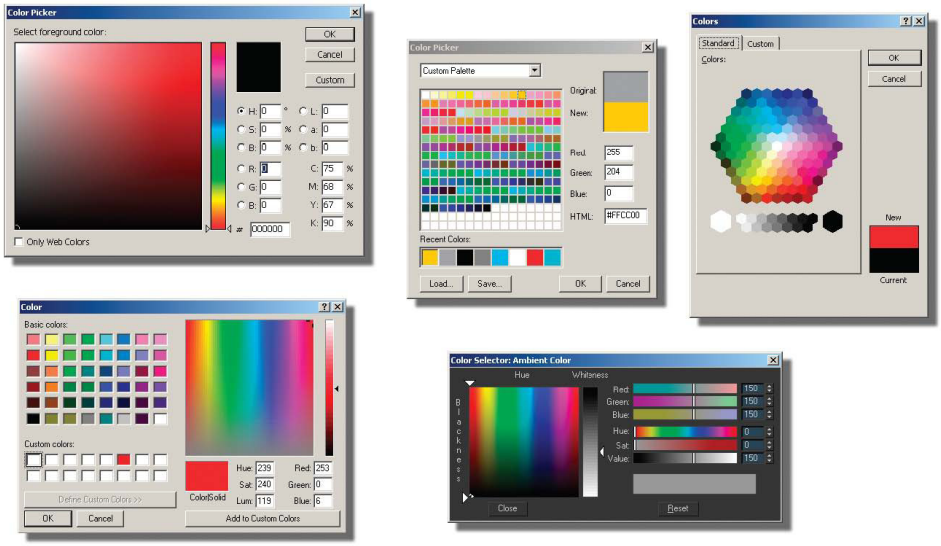


Figure 1-14 Here are Color Pickers from various applications.

Color

We all know what color is in an everyday fashion, "Get me those pliers. No, the ones with black handles ...I said paint the house green—I didn't mean neon green!" That's all fine for the civilian discussion of color, but when you begin to speak with artists about color, you need to learn to speak of color intelligently and that takes a little more education and some practice. You will also learn to choose and combine color, too. In games, as in movies, interior design, and other visual disciplines, color is very important. Color tells us much about the world and situation we are in. While I was at CMP, we developed a massively multiplayer game that started in the town—saturated green grass, blue water, butterflies—you get the picture, this was a nice and safe place. As you moved away from town, the colors darkened and lost saturation. The grass went from a brighter green to a less saturated brownish-green. There were other visual clues as well. Most people can look at grass and tell if is healthy, dying, kept up, or growing wild. Away from town the grass was also long and clumpy, dying, and growing over the path. But even before we changed any other aspect of the game—still using the same grass texture from town that was well trimmed—we simply lowered the saturation of the colors on the fly and you could feel the life drain from the world as you walked away from town. As you create textures you will most assuredly have some form of direction on color choice, but maybe not. You might need to know what colors to choose to convey what is presented in the design document and what colors will work well together.

This section lays out a simple introduction to the vocabulary of color, color mixing (on the computer), and color choices and their commonly accepted meanings. I decided to skip the complex science of color and stick to the practical and immediately useful aspects of color. Color can get very complex and esoteric, but you would benefit from taking your education further and learning how color works on a scientific basis. While this chapter will be a strong starting point, you will eventually move on from working with only the colors contained in the texture you are creating to how those colors interact with other elements in the world, such as lighting. To start with, however, a game texture artist needs the ability to communicate, create, and choose colors.

First, we will address the way in which we discuss color. There are many color models, or ways of looking at and communicating color verbally. There are models that concern printing, physics, pigment, and light. They each have their own vocabulary, concepts, and tools for breaking out color. As digital artists, we use the models concerning light since we are working with colored pixels that emit light. A little later we will take a closer look at those color systems from the standpoint of color mixing, but for now we will look at the vocabulary of color. In game development you will almost always use the RGB color model to mix color and the HSB color model to discuss color. You will see that Photoshop allows for the numeric input and visual selection of color in various ways. When you discuss color choices and changes and then go to enact them, you are often translating



Figure 1-15 The saturation of the color red at 100% and decreasing to 0% by adding white.



Figure 1-16 The brightness of the color red at 100% and decreasing to 0% by adding black.

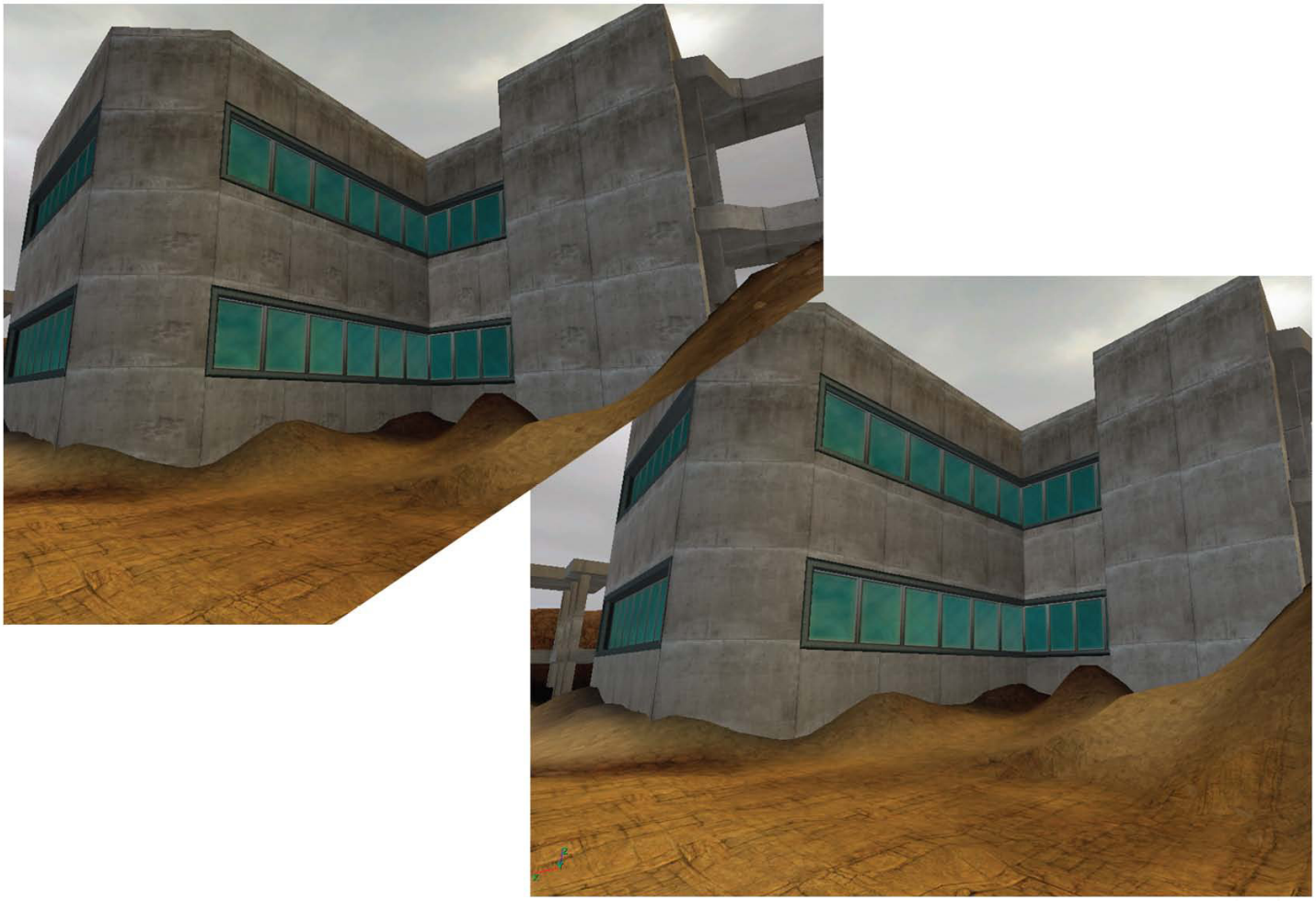


Figure 1-17 Here is an example of a texture that may have looked okay in Photoshop, but needed to be corrected to fit in the scene correctly. This is a subtle example. Notice the patch of exposed stone in the concrete on the building that repeats?

between two or more models. Don't worry; this is not difficult and most people don't know they are doing it.

First, we will look at the HSB model, which stands for Hue, Saturation, and Brightness since this is the most common way for digital artists to communicate concerning color. These three properties of color are the main aspects of color that we need to be concerned with when discussing color. In Figure 1-13 you can see examples of these aspects of color.

• Hue is the name of the color (red, yellow, green).
• Saturation (or Chroma) is the strength or purity of the color.
• Brightness (or Value) is the lightness or darkness of the color.

Hue

Most people use the word "color" when referring to hue. While there are many, many colors, there are far fewer hues. Variations of saturation and brightness create the almost unlimited colors we see in the world. Scarlet, maroon, pink, and crimson are all colors, but the base hue for all of these is red.

Understanding color and its various properties is best done with visual examples. The most often used method is the Color Wheel developed by Johannes Itten. We will look at the Color Wheel a little later. In Photoshop you will recognize the Color Picker, which allows for various methods for choosing and controlling color, both numerically and visually. The Color Picker has various ways to choose color, but the most commonly used is RGB (Red, Green, Blue) — Figure 1-14.

Saturation

Saturation quite simply is the amount of white in the color. In Figure 1-15 you can see the saturation of a color being decreased as white is added. If you have access to a software package like Photoshop and open the color picker, you can slide the picker from the pure hue to a less saturated hue and watch the saturation numbers in the HSB slots go down as the color gets less saturated. Notice how the brightness doesn't change unless you start dragging down and adding black to the color. Also, you may want to look down at the RGB numbers and notice how the red in RGB doesn't change, but the green and blue do.

Brightness

Brightness is the amount of black in the color. In Figure 1-16 you can see the brightness of

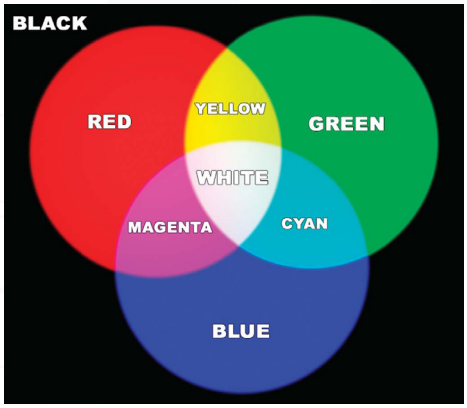


Figure 1-18 The additive system works by adding lights. Black is the absence of light (the area outside of the spotlights), White is all light (the center area where all three lights overlap each other). The combination of red, green, and blue is the additive system.

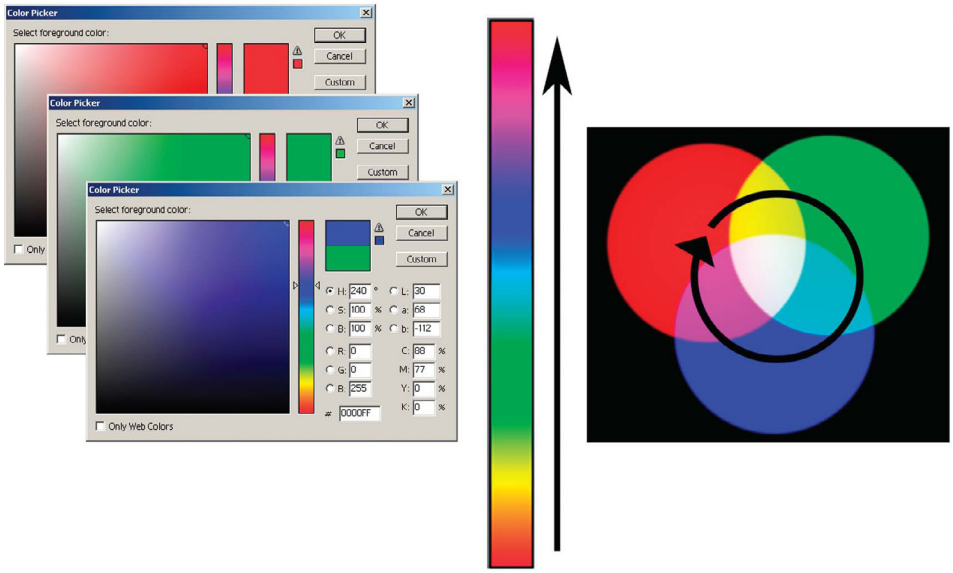


Figure 1-19 The Color Picker in Photoshop has a vertical rectangle of color graduating from red through the colors and back to red. This allows you to select a hue and use the Color Picker Palette to change the value and intensity.

a color being decreased. As in the previous example discussing saturation, you can open the color picker in Photoshop and this time, instead of decreasing the saturation, you can decrease the brightness by dragging down. You can look at the HSB and the RGB slots and see the brightness numbers decreasing. Also notice that this time in the RGB slots the red numbers decrease, but the blue and green are already at zero and stay there.

Like most other aspects of color, brightness is affected by other factors. What colors are next to each other? What are the properties of the lights in the world? Another job the texture artist needs to do is to make the textures in the world are consistent. That involves balancing the hues, saturation, and brightness of the color in most cases. Figure 1-17 depicts an example of a texture that may have looked okay in Photoshop, but needed to be corrected to fit the scene. You can see that a great deal of contrast and intensity of color makes tiling the image a greater challenge.

Color Systems—Additive and Subtractive

There are two types of color systems, additive and subtractive. Subtractive color is the physical mixing of paints, or pigments, to create a color. It is called "subtractive" due to the fact that light waves are absorbed (or subtracted from the spectrum) by the paint and only the reflected waves are seen. A red pigment, therefore, is only reflecting red light and absorbing all the others. In the subtractive system you get black by mixing all the colors together— theoretically. It is a challenge to mix pigments that result in a true black or a vibrant color. That is one of the reasons art supply stores have so many choices when it comes to paint. One of our advantages of working in the additive system is that we can get consistent and vibrant results with light. We won't dwell on the subtractive system since we won't be using it.

The additive system is when light is added together (like on a computer screen) to create a color, so naturally we deal with the additive system as computer artists as we are working with projected light. In Figure 1-18 you can see

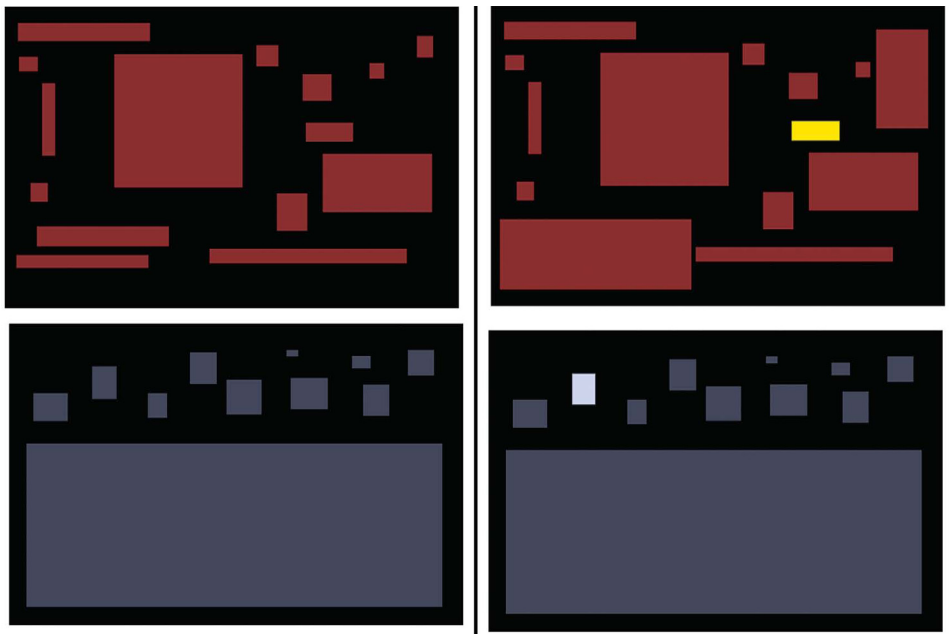


Figure 1-20 The larger shapes dominate, but the small shapes demand your attention once color is added.

how the additive system works. I simply went into Max and created three spotlights that were pure red, green, and blue and created my own Additive Color Wheel, or a visual representation of how the colors interact. Black is the absence of light (the area outside of the spotlights), White is all light (the center area where all three lights overlap each other)—the combination of red, green, and blue is the additive system. If you look at the Color Picker in Photoshop (Figure 1-19) you will see a vertical rectangle of color graduating from red through the colors and back to red. This allows you to select a Hue and use the Color Picker Palette to change the value and intensity.

Primary Colors

The three primary colors in the additive color system are red, green, and blue (RGB). They are referred to as primary colors because you can mix them and make all the other colors, but you can't create the primary colors by mixing any other color. Many projection televisions use a system where you can see the red, green, and blue lens that project the three colors (RGB) to create the image you see using the additive method.



Figure 1-22 In a room full of normal objects, the players' eyes will be drawn to the fire and then equally to the objects. In a room full of normal objects, a red crate draws attention, especially given the fact that there are other normal crates around it.





Figure 1-21 Your eye is most likely drawn to the opening of the doghouse in the black and white photo, but add color, and the flower draws the primary interest.

Secondary Colors

The secondary colors are yellow, magenta, and cyan. When you mix equal amounts of two primary colors together, you get a secondary color. You can see that these colors are located between the primary colors on the color wheel and on the Photoshop Color Picker vertical strip.

Color Emphasis

Color is often used for emphasis. Look at Figure 1-20. All things being equal, the larger shapes dominate, but the small shapes demand your attention once color is added. Of course, there are many other forms of emphasis you can use in creating art, but color can be the most powerful—and the most overused. Ever come across a web page that has a busy background and every font, color, and emphasis devised by man splashed across it? There is almost no emphasis as all the elements cancel each other out. Often, less is more.

In another example using a photograph, in Figure 1-21, you can see that in the first black and white photo, your eye would most likely be drawn to the dark opening of the doghouse and you would most likely assume that the subject of this picture is the doghouse. In the second version the colorful flower draws the primary interest, it still competes with the doghouse entrance for attention, but you would probably make the assumption that the focus of this picture was the flower.

In a game scene you can see the use of color drawing the attention of a player to an important item. Look at Figure 1-22. In the first version of the scene you are drawn to the fire and then look around at all the items in the shadows. In the second version the red crate draws your attention and clearly means something. Depending on the world logic of the game you are playing, that could simply mean that you can interact with the object, or it could mean the item is dangerous. That decision brings to our next topic, color expression..

Color Expression or Warm & Cool Colors

When you start painting textures and choosing colors, you will want to know how they react together in terms of contrast, harmony, and even message. There is a lot of information on this topic and once again, Johannes Itten (the guy who did the color wheel) enters the picture. Itten has provided artists with a great deal of information on how color works and how they work together. He was among the first people to look at color, not just from a scientific point of view, but from an artistic and emotional point of view. He was very interested in how colors made people feel. From his research we get the vocabulary of warm and cool colors.

We all are familiar with this convention as it is mostly based on the natural world. When asked to draw a flame, we reach for the red or orange crayon, ice is blue, the sun yellow. Each warm and cool color has commonly associated feelings for them, both positive and negative. The brighter or more pure the color, the more positive the association. Darker and duller colors tend to have the negative connotations associated with them.

The warm colors are red and yellow, while the cool colors are blue and green. Children will color the sun yellow and ice blue and use the black crayon to scratch out things they don't like. Traffic lights are hot when you should stop or be cautious (red and yellow) but cool when it is okay to go (green). Red and orange are hot and usually associated with fire, lava, coals. How many red and black shirts do you see at the mall? Red and black generally symbolize demonic obsession. Red by itself can mean royalty and strength as well as demonic. Deep red can be erotic. Yellow is a hot color like the sun, a light giver. Yellow is rich like gold as a pure color. A deep yellow (amber) window in the dark of a cold night can mean fire and warmth. But washed out or pale yellow can mean envy or betrayal. Calling a person yellow is an insult, meaning he is a coward. Judas is portrayed as wearing yellow garments in many paintings. During the Inquisition, people who



Figure 1-23 These three scenes are the same, except for the ax. What questions and/or assumptions run through your mind looking at each version?



Figure 1-24 While dramatic perspective is used in traditional art, it is not used in a game texture, but there is some notion of perspective so it is best to understand the concept.

were considered guilty of heresy were made to wear yellow. Moving into green, we think of lush jungles teaming with life. As green washes out, we get a sense of dread and decay (zombie and orc skin). Vibrant green in a certain context can be toxic waste and radioactive slime. Blue in its saturated state is cold like ice, fresh like water and the sky. Darker blues are misery. Purple is mysterious and royal.

Keep in mind that color is context-sensitive. Water is generally blue; would you drink dark green water? But not just any blue will do. In the real world, if we come across water that is a saturated blue that we can't see through, we get suspicious. Was this water dyed? Are there weird chemicals in there? If anything lives in that, then what could it be?! Blood is generally red, but what if an enemy bled green? What if the game you are playing is about an alien race taking over earth and one of your companions bleeds green from an injury during combat? In a fantasy game you might come across coins. Which coin do you take, the bright yellowish metal or graygreen metal? With no previous information on the color of coins in this world, most people would pick the brighter yellow. Look at Figure 1-23. What are some of the assumptions you might make about these three scenes?

Looking at color in this way may make it seem a bit mechanical, but it still takes a talented artist to make the right color choices. You can memorize all the information in the world, but it usually comes down to having a good eye and being able to convey that vision in your work and to your coworkers.

Perspective

We discussed earlier in this chapter that dramatic perspective (Figure 1-24) is usually not used in the creation of a game texture, although sometimes perspective is present and needs to be understood. In addition, understanding perspective is not only a valuable artistic tool to have available, but understanding perspective will help you when you are taking digital

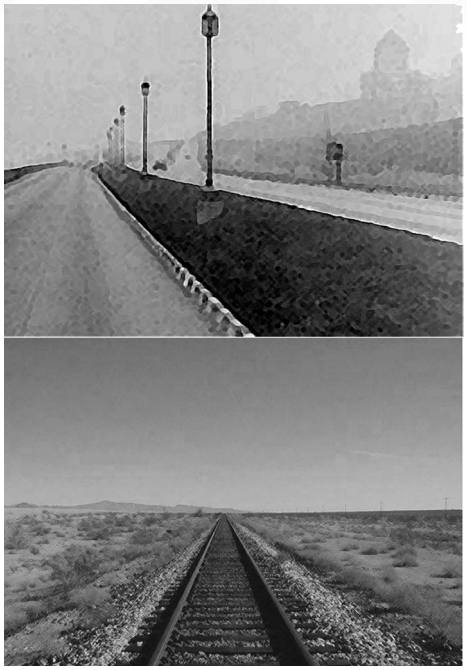


Figure 1-25 Perspective is the illusion that something far away from us is smaller. Are the street lights actually getting smaller in this image? Are the train tracks really getting closer together?

reference images and when you are cleaning and straightening those images. We will look at the artistic aspects of perspective now and later on in the chapter on cleaning and storing your assets we will talk about fixing those images.

Quite simply, perspective is the illusion that something far away from us is smaller. This effect can be naturally occurring as in a photo, or a mechanically created illusion in a painting. You can see samples of this in Figure 1-25. In 2D artwork perspective is a technique used to recreate that illusion and give the artwork a three-dimensional depth. Perspective uses overlapping objects, horizon lines, and vanishing points to create a feeling of depth. You can see in Figure 1-26 an image with the major lines of perspective as they converge on one point called the vanishing point. There are several types of perspective used to achieve different effects.

One-Point Perspective

One-point perspective is when all the major lines of an image converge on one point. You

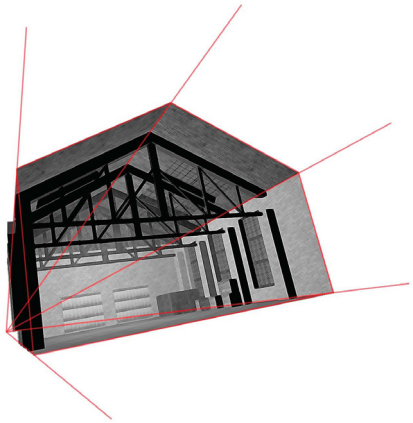


Figure 1-26 In 2D artwork perspective is a technique used to recreate that illusion and give the artwork a three-dimensional depth.

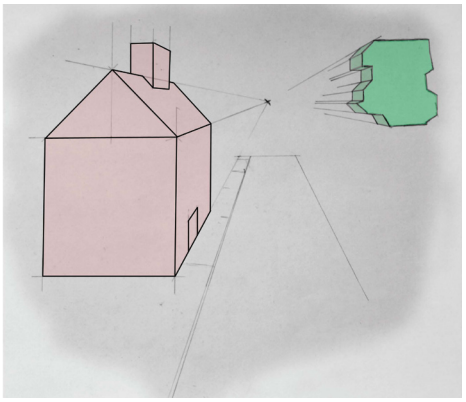


Figure 1-27 In one-point perspective all the lines that move away from the viewer seem to meet at a far point on the horizon. This point is called the vanishing point.

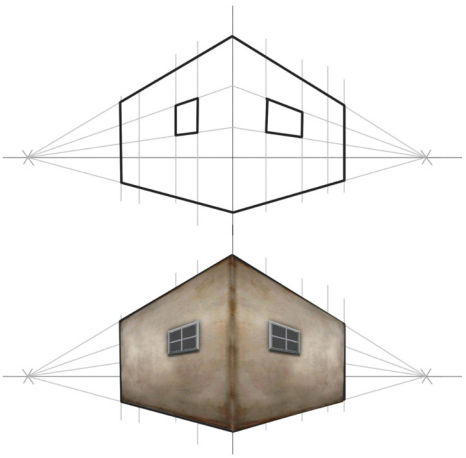


Figure 1-28 Two-point perspective has two vanishing points on the horizon line. All lines, except the vertical, will converge onto one of the two vanishing points.

can see this effect best illustrated when looking down a set of straight railroad tracks or a long road (see Figure 1-25). The lines of the road and track, although we know they are the same distance apart, seem to meet and join together at some point in the far distance—the vanishing point. In one-point perspective all the lines move away from you (the z-axis) and converge at the vanishing point. Vertical and horizontal or up and down and right and left lines (X and Y) remain straight, as seen in the Figure 1-27.

Two-Point Perspective

One-point perspective works fine if you happen to be looking directly at the front of something or standing in the middle of some railroad tracks, but what if the scene is viewed from the side? Then you shift into two-point perspective. Two-point perspective has two vanishing points on the horizon line. All lines, except the vertical, will converge onto one of the two vanishing points. See Figure 1-28.

Three-Point Perspective

Three-point perspective is probably the most challenging of all. In three-point perspective every line will eventually converge on one of three points. Three-point perspective is the most dramatic of all and can often be seen in comic books when the hero is flying over buildings or whooping butt in the alley below as the buildings tower above. Figure 1-29 shows some three-point perspective.

Perspective, from the texture artist's point of view while photographing surfaces for game art, can be the enemy. We will look at that in a coming chapter when we talk about collecting and cleaning your images. From the art education point of view, knowing what perspective is and what it looks like is enough.

Quick Studies of the World Around You

The following pages are some quick studies I did of random objects. I tried to work through each of them as a game artist might to give you some quick and general examples of various how a game artist might break them down. We will do this type of exercise in more depth throughout the book, but in the tutorial portions of the book those breakouts will be more specific and focused to the goal at hand. This is a general look and introduction to the thought process of recreating surfaces and materials in a digital environment. I covered all that was introduced in this chapter: shape and form, light and shadow, texture, color, as well as considering other aspects of the object or material. I didn't touch on perspective in these exercises because I wanted to limit the exercise to recreating 2D surfaces (textures), and perspective is not as critical as the other concepts in this chapter. In the following pages, Figures 1-30 to 1-35 will each have a caption that discusses the particulars of each study.

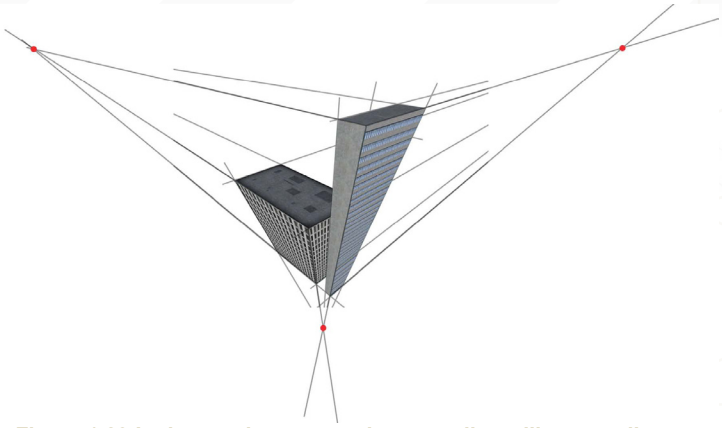


Figure 1-29 In three-point perspective every line will eventually converge on one of three vanishing points

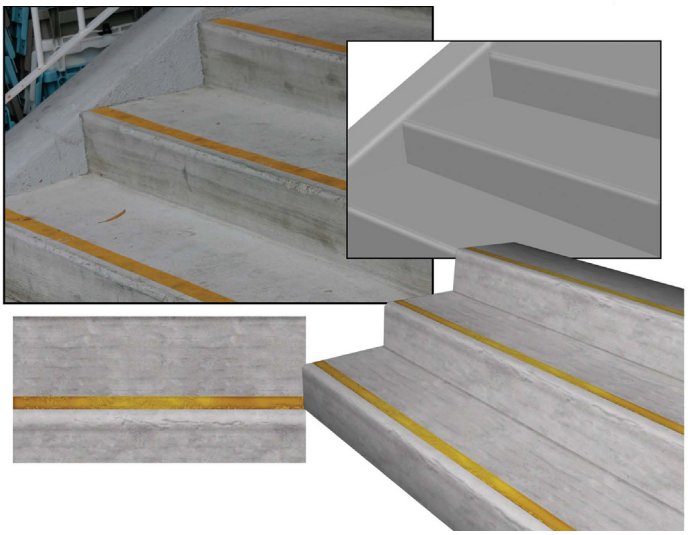


Figure 1-30 The upper left-hand image is a digital photo of some simple concrete stairs. You may have an art lead email you an image like this and tell you she wants a texture based on these stairs. Fortunately, this is a rather simple form; not a lot of color or detail to distract us. Look at the simple recreation of the stairs to the right showing the basic light and shadow patterns on the stairs. The lower left image shows the 2D texture created in Photoshop to be applied to a 3D model of the stairs. If you look at the yellow stripe on the stairs and compare it to the stripe on the texture, you can see the highlights painted in the texture where the edge of the step is and the shadow under the lip of the edge. If you were able to examine the original digital image of the stairs closely, you would see an almost infinite amount of detail. Part of the texture artist's job is to know when to draw the line. Here I didn't include every scuff and mark from the original stair image because it wouldn't work. You will learn in coming chapters that such details usually stand out and draw attention to the repeating pattern of a texture, or in the case of fabrics and fine meshes can create noise or static in the texture. I created this texture pretty quickly; given more time, I would experiment with the chips and wear on the edge of the steps to add more character.

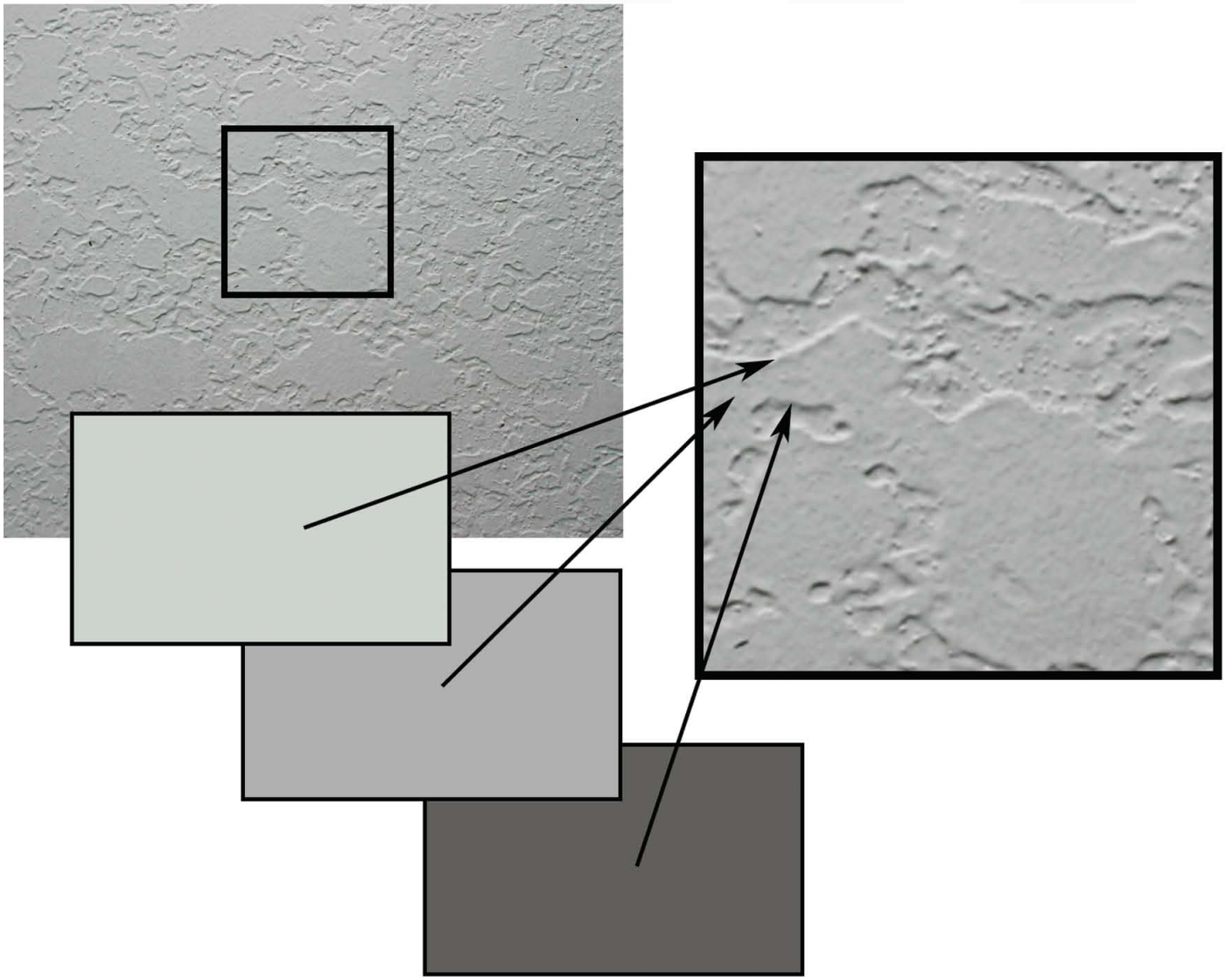


Figure 1-31 This is a straight-on photo of an interior plaster wall. I included this obviously unexciting image to demonstrate that even in such a simple surface there can be complex highlight and shadow going on. Look at the color swatches of the highlight, shadow, and mid-tone. Notice that the colors are not simple black, white, and gray. The highlight is not pure white or light gray, but a very pale green. Look at the close-up of the image. You can clearly see the consistent behavior of light as it highlights the upper ridges of the plaster and shadow falls from the lower edges. Once you start studying such seemingly commonplace things, like a wall you may walk by a hundred times a day, you will start to notice, understand, and remember how various lights, materials, and other factors affect a surface. Do you convey that simple raised pattern in the texture, using geometry, or a shader? Of course, that depends on many factors, and hopefully by the end of this book you will know what questions to ask to determine the answers.

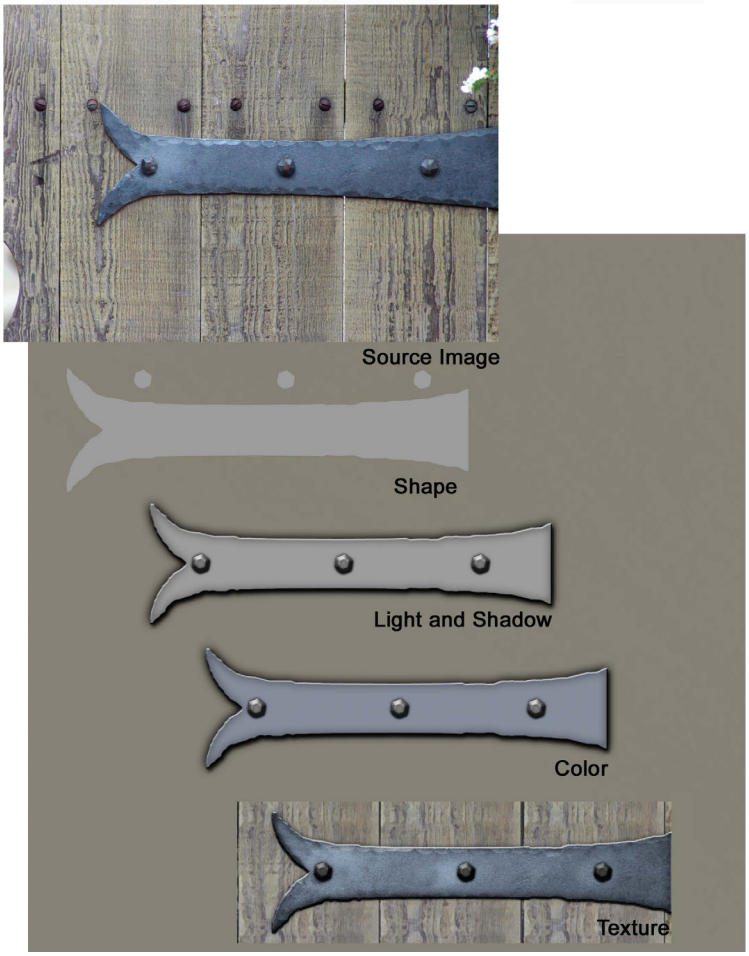


Figure 1-32 This image simply shows the world that I need to wash my car. Seriously, look at the various parts of complex objects and you will see a variety of surface behaviors. Notice how the paint is highly reflective and mirrors the world around the car. The metal is not flat like a mirror, so notice the distortion of the reflected image. The windows, while reflecting the surrounding world as well, are translucent so you can also see what's behind the window and on the other side of the car. The window also has a patina of dirt and spots on it. If you needed to recreate this as realistically as possible, you would have to take all those aspects into consideration and determine the best way to achieve the effect. Look at the close-up of the rim. You can see that the highlights are not mirror-like in their accuracy, but rather they are a diffuse notion of highlight. Looks simple to paint, but wheels rotate and will instantly look bad if not painted properly. Using a real-time process for highlights eliminates this problem. While the tires are flat black and reveal only a faint notion of highlight, depending on the detail level, you may be dealing with complex mapping and shader effects here, too. While all of this seems obvious, taking the time to examine the object you are recreating and understanding what you are seeing and how to verbalize it helps when turning the object into game art. If you were to make materials or textures for this vehicle, you would need to know many things about the technology and how the car will be used in the game. Can we have real-time environmental reflections? Can we fake them using a Shader? Do we have to carefully paint in a vague notion of metallic highlights that work in all situations the car may be in? And the windows. Can we do a translucent/reflective surface with an alpha channel for dirt? If the car is used in a driving game where the vehicle is the focus of the game and the player gets to interact up close and personal with the car, then I am sure a lot of attention will be given to these questions. But if this car is a static prop, sitting on a street that the player blazes past, then over-the-top effects may only be a waste of development time and computer resources.



Figure 1-33 This sewer intrigued me; a simple shape of a common item that many may overlook as not worthy of serious attention. Some may have the attitude that it is only a sewer grate, so make it and move on. But a shiny new sewer grate with clean edges would stand out in a grungy urban setting. Look at this sewer grate. It is made of iron and looks solid and heavy. It was probably laid down decades ago and has had thousands of cars drive over it, people walk over it, millions of gallons of rain water pour through it. On the image at the upper left you can look at the iron and see how it is rusted, but so well worn that the rust is polished off in most places. Dirt has built up in the cracks between the grate, the rim, and the concrete. Even little plants have managed to grow. Look at the close-up at the upper right and you can see just how beat up this iron is and how discolored it has become. At the lower left I desaturated and cleaned up a portion of the image to see just how the light and shadow are hitting it and to get a feel for the quality of the surface. In this image you can more clearly see the roughness of the cement and the metal, and while the circular grate looks round from a distance, up close there are no straight edges and smooth curves. All this detail can't be depicted 100% in a game texture, but knowing it's there and understanding what you are seeing will allow you to convey a richer version of the grate as you will learn to focus on those details that add realism and character. On the lower right is a texture I did, and you can see that I was able to quickly achieve a mottled and grungy look for the metal and the edges. There are a few places at the top where I started the process of eating away at the concrete and the metal a bit.

Figure 1-34 This image is similar to the sewer in approach. Here I wanted to point out how a simple shape can be turned into an ornate hinge with little effort. The top image is the original digital photo of the hinge. I drew the shape of the hinge in Photoshop. You may notice that I drew the screws separately. This is because you need the shapes separately to work with them in Photoshop; you will see why later in the book. In Photoshop I applied and adjusted the Layer Effects and then colored the hinge close to the overall color of the original. After that it was a matter of applying the right filters and doing some hand work to get the edges looking right. We will be doing this type of work throughout the book. And I will remind you from time to time that while the best approach may be to use photo source, or any one of the other methods available, the focus of this book is to help you develop a set of Photoshop skills that will allow you to not depend on any one method. These skills will improve your abilities when working in any of the other methods.



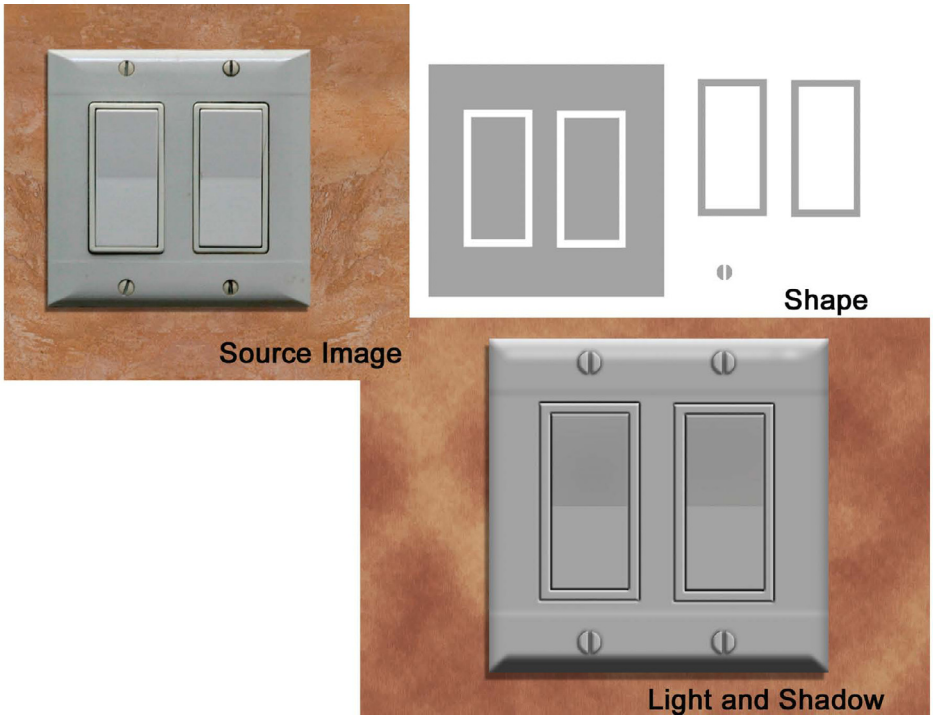


Figure 1-35 This light switch is a common object you may need to create. Instead of taking the time to clean up and manipulate a photo, you can just make one quicker from scratch. The switch is composed of simple shapes with the layer effects applied. The wall behind the switch was a quick series of filters run to add a base for this exercise.

Conclusion

This chapter was an overview of the most basic, but critical, aspects of traditional art. Understanding the concepts in this chapter, and further exploring them on your own, will make you a much better texture artist...

A Basic (Game) Art Education

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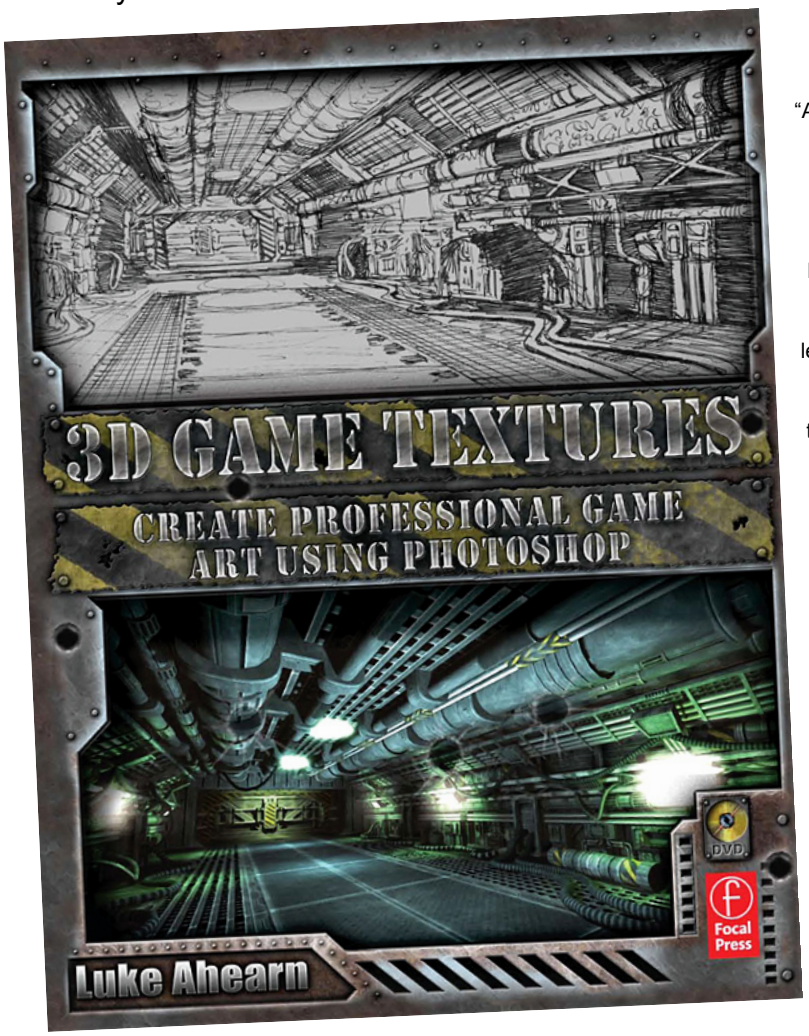
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3D Game Textures:

Create Professional Game Art Using Photoshop

By Luke Ahearn



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"Both Geico and The Martin Agency wanted to be able to take the Gecko in completely new directions, and the new spots show how we made that possible."

Framestore NY gets Geico Gecko geared up over lower rates

Geico Gecko

Framestore CFC was formed in December 2001 through the union of two of the most creative and dynamic companies in the industry: FrameStore and The Computer Film Company (CFC). The company is now the largest visual effects and computer animation company in Europe, with over 30 years of combined experience in digital film and video technology...

Geico Gecko

Framestore NY Directs, Edits, and Recreates VES Award-Winning "Geico Gecko" Character for New Series of Geico Spots via The Martin Agency

NEW YORK, NY - March 22, 2007 - Not so long ago, auto insurance company Geico and ad agency The Martin Agency approached animation and effects company Framestore NY to draw on the 3D talents behind such projects as Walking with Dinosaurs, Dinotopia, and Harry Potter and the Goblet of Fire, and "reinterpret" the already-beloved Geico Gecko mascot.

The Framestore NY team took them at their word, transforming the urbane lizard into a more versatile, decidedly cheekier cockney bloke. The risky move paid off, evidenced by the new Gecko's win as "Outstanding Animated Character in a Live Action Broadcast Program, Commercial or Music Video" at the 5th annual VES (Visual Effects Society) Awards.

Never ones to rest on their laurels, the Framestore NY team recently reteamed with The Martin Agency and upped the ante in eight comedy-driven new spots featuring the loveable reptile. This time around, however, Framestore NY provided much more than animation and visual effects. The spots were co-directed (with Joe Lawson) by Framestore Animation director/Effects Supervisor David Hulin. The company also handled the editing of the spots.

"I believe the key to the success of the Geico spot was in our relationship with the client," says Framestore NY President Jon Collins. "We already had a good working relationship with The Martin Agency, and we were delighted with the opportunity to work with the Gecko again. He's a wonderful, iconic character, and we were all excited about taking him further."



Framestore NY David Hulin commented, “We feel so close to the Gecko now and, this time, we were involved from the very beginning, even before the scripts were written. The extra involvement gave us the chance to train our Gecko to show more street-smarts, sales savvy, and his own quirky brand of humor. He’s an East End geezer type, and his cockney accent and mannerisms are an endless source of comedic possibilities. The new spots just let us have even more fun with him.”

‘MONUMENTAL’ NEWS

Currently airing, the new spots present the amiable Gecko in his best “stream-of-consciousness” mode; although completely committed to Geico’s cause, he is sometimes distracted, not to mention puzzled, by the world around him. In “Monumental,” a 30 second spot specifically for the Virginia market, our Gecko sits comfortably on the stone steps of a residential city street. Blithely commenting that there is some ‘monumental news,’ he fairly quivers as he tells of lower insurance rates in Virginia, explaining that it is “all he can think about.” With the Geico’s explanation comes a realization: he has no idea where he is. Despite his confusion, however, he manages a friendly greeting to a passerby.

Similar in tone is “Local,” in which our friend strolls leisurely along a window ledge while explaining that, whether they call, write, or visit, viewers will get great service. He goes on to explain that visiting the local office might get you some “biscuits ‘n gravy,” if Geico had any, which they don’t. Confusing even himself, the Gecko turns and knocks on the window, apparently telling a motorist not to park outside. The Gecko gamely attempts to remain on-message in the shorter spot “Seconds,” only to end up questioning whether he can get his point across in such a short space of time. His querying is abruptly interrupted, however, by the final Geico voiceover.

“When we were coming up with our Gecko, [Framestore Senior Animator] Andy Walker and I created a tailor-made animation pipeline,” says Hulin. “Both Geico and The Martin Agency wanted to be able to take the Gecko in completely new directions, and the new spots show how we made that possible.





The new Gecko is able to sit down and climb things in every conceivable situation The pipeline makes the lighting and the rendering very smooth. As always, we want to make sure that he performs as naturally and looks as good as he possibly can."

ABOUT FRAMESTORE NY

Framestore CFC opened its New York office in January 2004, with the aim of building on its burgeoning international reputation with US agencies. Early 2005 found Framestore NY relocating to new premises on Spring Street, SoHo... complete with roof meadow! The caliber of work produced out of the office has gone from strength to strength with spots created for Axe, Coke, FedEx, Discover Card, Pepsi, Sprite, Dodge and Propel, in addition to the creation of a nine spot campaign rebranding the Geico gecko.

Of her experiences with the Framestore NY team on a spot for Bailey's Irish Cream, noted film director Kathryn Bigelow said, "Framestore NY is the epitome of what a great visual effects house should be: a magical combination of extraordinary talent, true vision plus perfect follow through." Framestore NY's awards collection includes a 2006 Emmy for Best Primetime Commercial for FedEx "Stick." In 2007, Framestore NY picked up a Visual Effects Society Awards show honor for Geico "Chat" in the "Outstanding Animated Character in a Live Action Broadcast Program, Commercial or Music Video" category. More information may be found at www.framestore.com





ABOUT FRAMESTORE CFC

Framestore CFC was formed in December 2001 through the union of two of the most creative and dynamic companies in the industry: FrameStore and The Computer Film Company (CFC). The company is now the largest visual effects and computer animation company in Europe, with over 30 years of combined experience in digital film and video technology.

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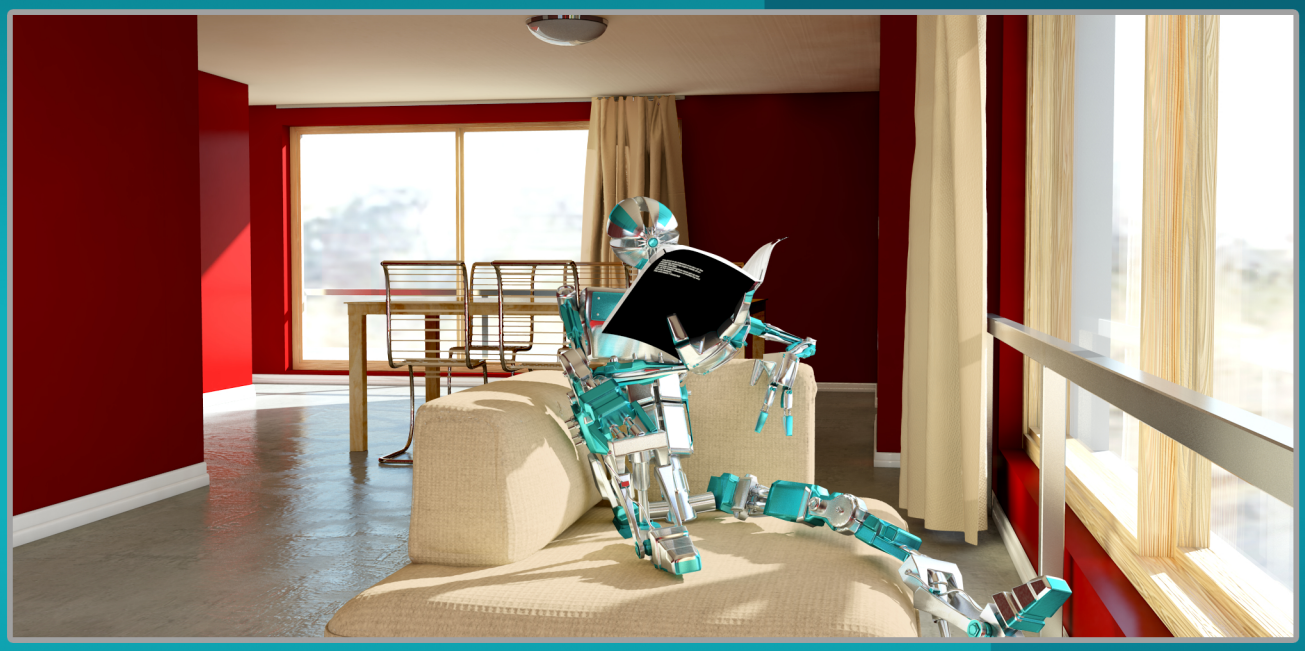
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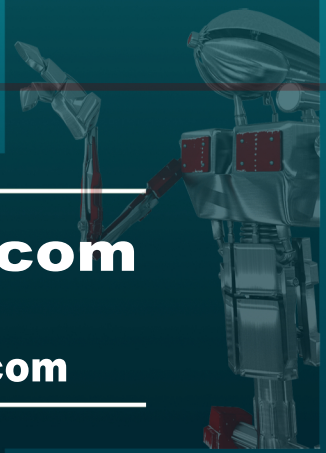
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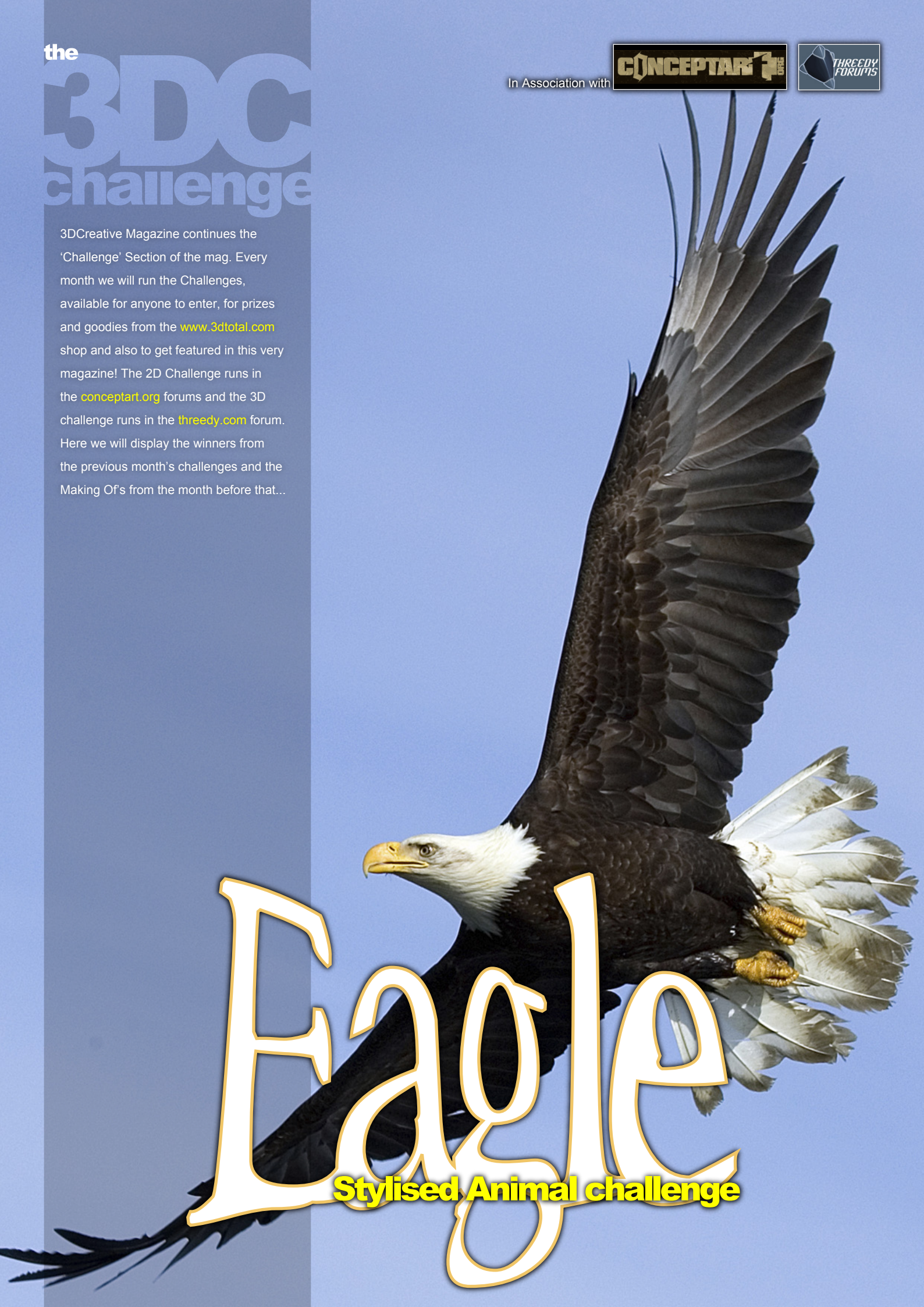
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A Geonome Production

the 3DC challenge

In Association with CONCEPTART.ORG and THREEDY FORUMS

3DCreative Magazine continues the 'Challenge' Section of the mag. Every month we will run the Challenges, available for anyone to enter, for prizes and goodies from the www.3dtotal.com shop and also to get featured in this very magazine! The 2D Challenge runs in the conceptart.org forums and the 3D challenge runs in the threedy.com forum. Here we will display the winners from the previous month's challenges and the Making Of's from the month before that...



Eagle

Stylised Animal challenge



Stylised Animal Challenge

Eagle

The Challenge

Welcome to the Stylised Animal Monthly Challenge. Each month we will select an animal and post some images in the Forum Thread as reference. All you have to do is to create a 3D image of this creature in a stylised / abstract / cartoon style, whilst keeping your creature instantly recognisable. We wanted to publish some content in 3DCreative Magazine on how to create stylised animals, such as you see in the many feature films and cartoon galleries. We thought this regular competition might bring in just the images / Making Of's that we need, whilst giving away great prizes and exposure. So far the competition has been a great success and now we need you all to keep it growing...

What are we looking for?

Funny and humorous entries which break the animal down to its most recognisable components; emphasize these in whichever ways you think best, and render your stylised / abstract / cartoon masterpiece. The rules are pretty laid back: please submit 1 x 3D render (minor post work is OK); its up to you if you want to have a background; include some graphical elements or text on your image. Renders of the 800 pixel dimension sound about right, but the winners will be featured in 3DCreative Magazine, so if you can create some higher resolution images too - all the better! There will be one competition per month, with the deadline being the end of the month (GMT). For a valid entry, just make sure your final image is posted in the main competition thread before the deadline. We require the top 3 winners to submit Making Of overview articles that will be shown on either 3DTotal or in 3DCreative Magazine. These need to show the stages of your creation - different elements and some brief explanation text - of why, and how, you did what you did. We will format this into some nice-looking pages to give you some great exposure, and us some quality content. Each competition will have one main thread which starts with the brief at the top. All entrants should post all WIPs, give feedback and generally laugh at the crazy ideas that are emerging each month... At the end of the month, a voting thread will be created in which all entrants need to post their final images. The voting then begins!



10th Hammering 3D



9th Hi Ho Silver



8th Singky

Challenge Thread

The entire EAGLE competition can be viewed here

The current challenge at the voting Stage is: ANTEATER

The Current Challenge taking place is: SNAIL



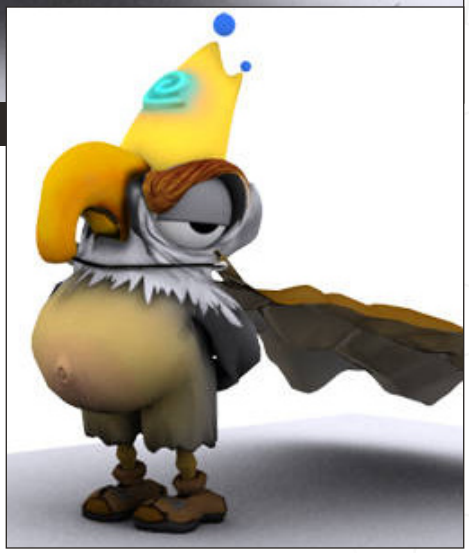
7th SithLord Steve



6th Kowai

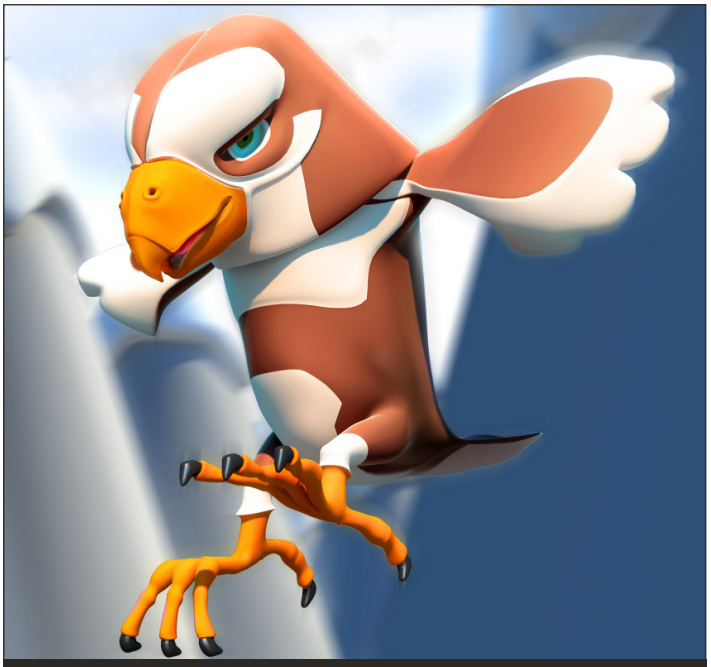


5th Mim





3RD GALERO



4TH MR_LEMON



2ND AUTHENTIC



1st Papumash



To join the next challenge, or to view previous, and/or current entries, please visit: www.threedy.com.

Or, for the 2D Challenge, please visit: www.conceptart.org
Or contact: ben@zoopublishing.com

2D Challenge

Here are last month's top entries from the 2D side of the competition...



1st FVallejo



2nd Chuck_Mate



3rd Muniz

Making Of's

Here are the Making Ofs from last month's Challenge...

3rd - Shahin Fathi Djalali

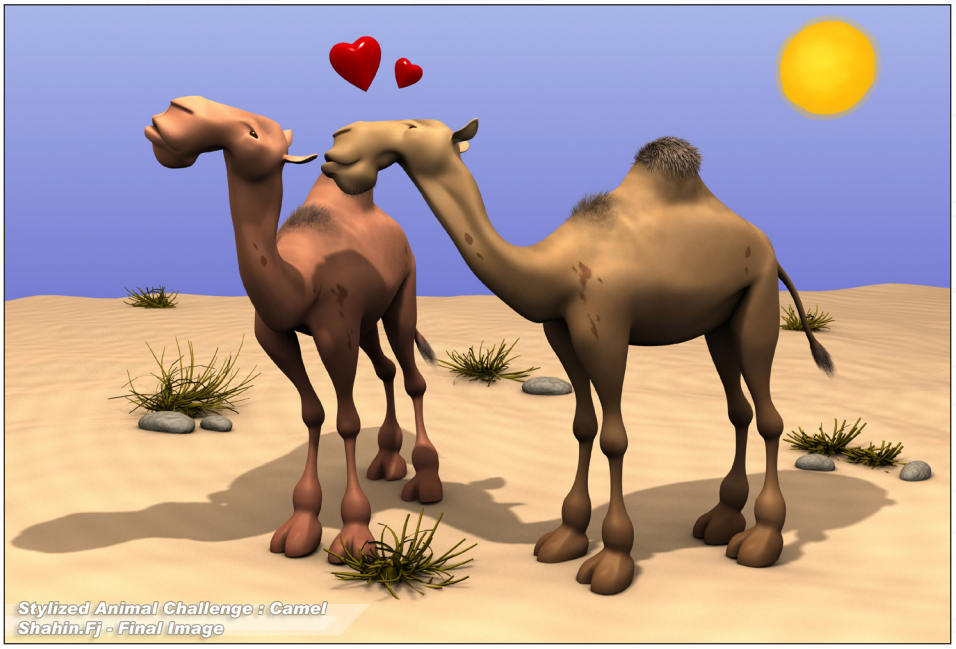
Read on to find out how I made the image "Camels' Romantic Scene", for the 3D stylised animal challenge...

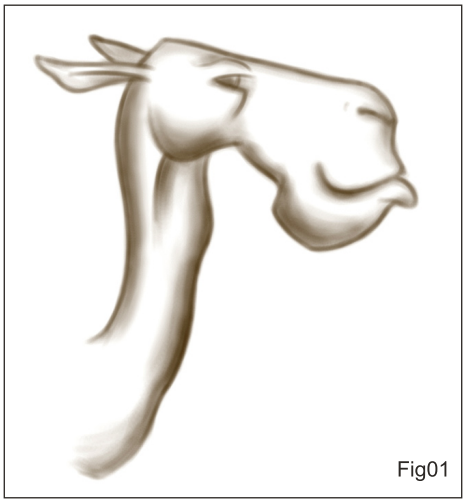
Concept and Stylizing:

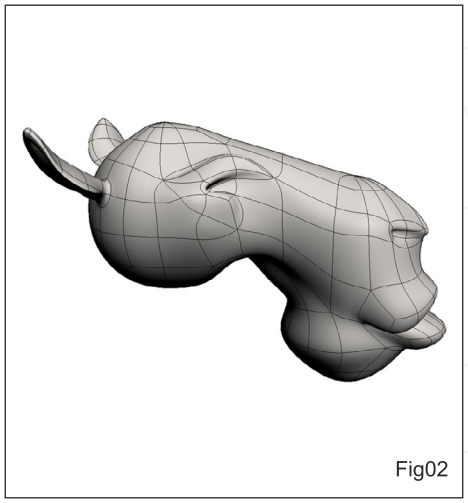
This concept came to me around Valentines day - after all, this was to be for the February challenge. My overall idea was to produce a romantic scene with two camels in a desert. I started the stylising of the subject - the camel - with a quick sketch (Fig01), focusing on the head of the animal. It was pretty much just a case of simplifying the overall shape and exaggerating certain areas, then the rest of the work was all done in 3D.

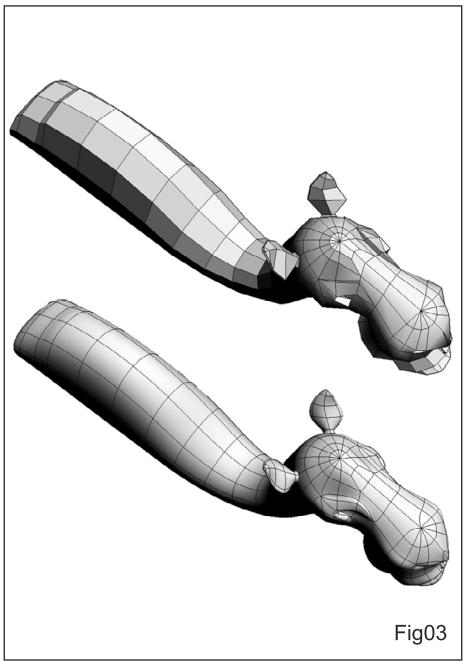
Modelling:

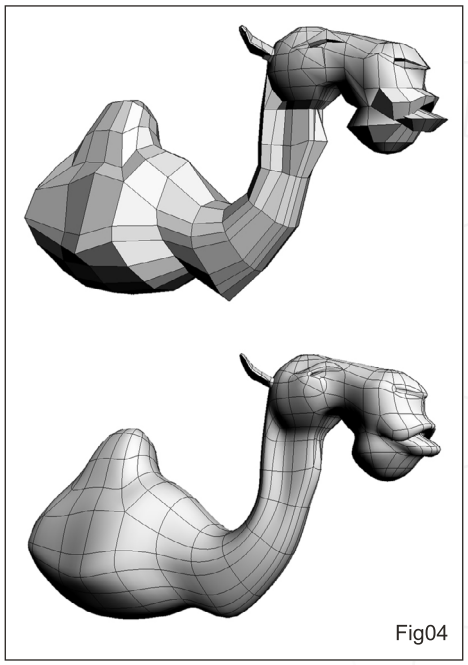
After I had observed and analysed the overall shape of the head, I began to model it. I used the poly modelling technique, starting by combining two spheres; one for the snout and one for the back of the head (Fig02). I then applied the "meshsmooth" modifier on it. The eyes are two separate spheres that were attached to the head as elements. Then I deleted the polygons at the bottom of the head and extruded the neck out by cloning the border that was created there. Somehow I found it easier to form the neck and the body using this method, rather than by extruding polygons, because I could then concentrate more on the form rather than the modelling. Although, it was necessary to adjust a few vertices after all (Fig03). By adjusting vertices and polygons I created the volume of the body, then extruded the hump from the top polygons and bent them aside to convey its weight (Fig04). For legs, I used the same technique that I did for the neck, but this time I made the front leg first, then cloned it for the rear one, and refined the connecting areas between the leg and body by adjusting and




Fig01

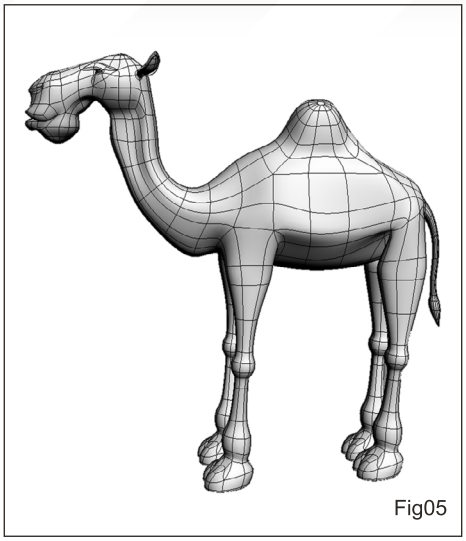

Fig02

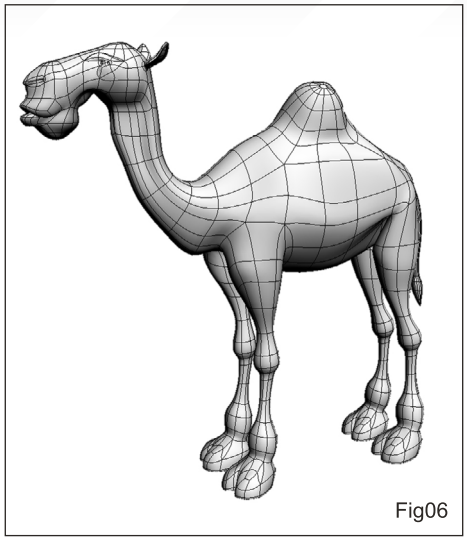

Fig03

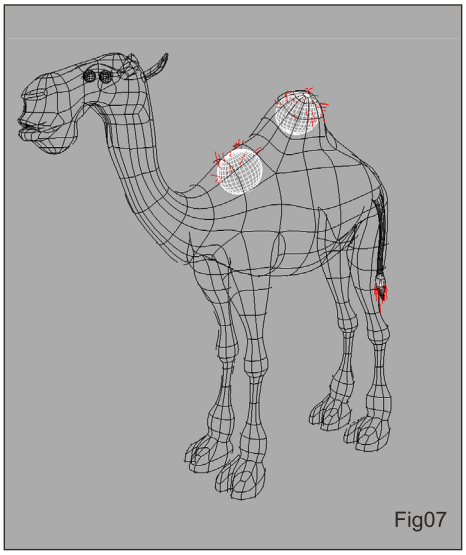

Fig04

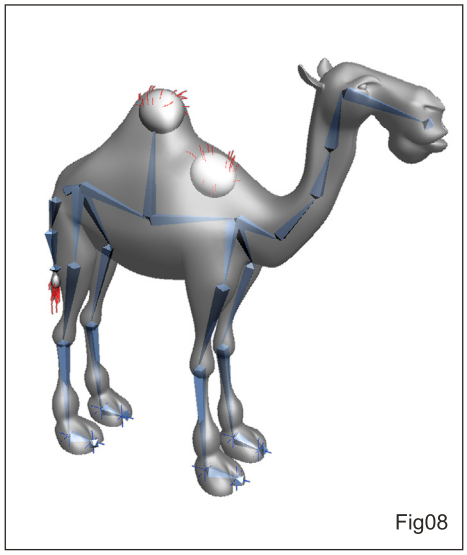


welding vertices. The two opposing legs were of course made using the symmetry modifier (Fig05). When I thought that the modelling process was complete, I saw the other cool models in the forum (especially the one made by Khalid) and so I then decided to refine my model. It is always good to get away from your work for a while and then again get back to it again, as this way you can see more bugs and errors that you just didn't see before. So after refining the model it came out like Fig06. As you can see the proportions are refined, the legs have more details and the head is a bit smaller. Although it is a cartoon model, making sure it looked balanced, and that the weighting looked correct, would help to make it more believable as a character. I tried to convey this by making the feet bigger and adjusting its posture. I used the Max default hair and fur modifier for the back, hump and tail fur, but I applied the modifier to separate spheres. This way I could adjust them more easily without the inconveniences of a hi-resolution mesh (Fig07).


Fig05


Fig06


Fig07


Fig08

RIGGING:

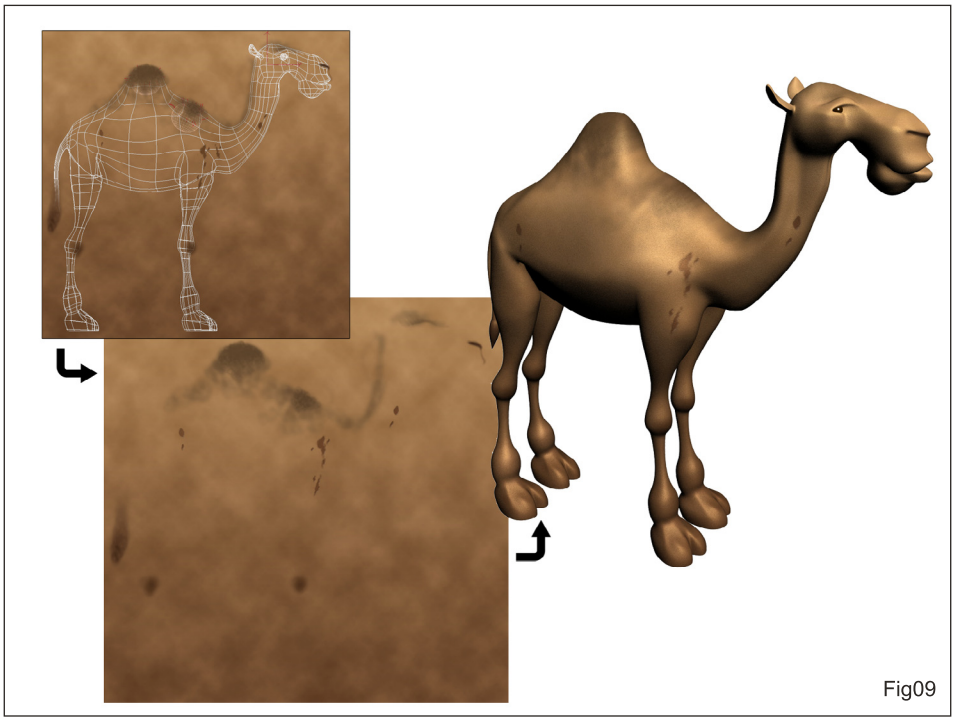
Since this model was made to produce an image and not an animation, I made a simple bone structure for it and linked the hair spheres to the nearest bones (Fig08).

TEXTURING:

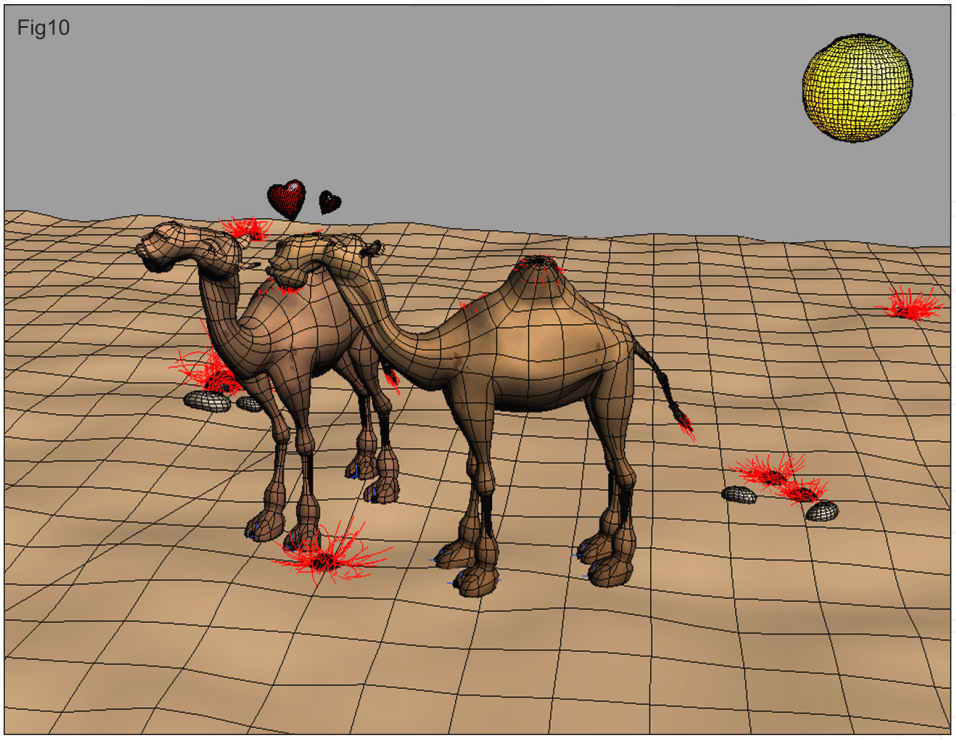
The whole body has one texture which was painted in Photoshop and applied to the mesh with UV coordinates. After I applied the UVW map modifier to the object and adjusted its "gizmo", I simply captured the side view in Photoshop and painted over it (Fig09). After that, I chose the correct colour for different hair objects and materials. When using a sky light plus the light tracer for the illumination of the scene, it is important to render the hair objects as geometry, and not as a buffer, because if you don't do that then the colour of the hair will vary from that you have chosen and its overall shading would be a mess.

SCENE SETUP:

The scene setup was simple too; there is a plane with a noise modifier for the ground, some deformed spheres for


Fig09

stones, some hemispheres with hair and fur modifier instead of plants, and two deformed spheres for the sun and its glow (Fig10).


Fig10

Scene Materials:

The ground material is a standard material with a wave as its diffuse map, and noise for a bump map. The sun material and its glow are the same standard materials with a high value of self-illumination, although the glow object material is more transparent. There is also a gradient map for the background.

Scene Lighting:

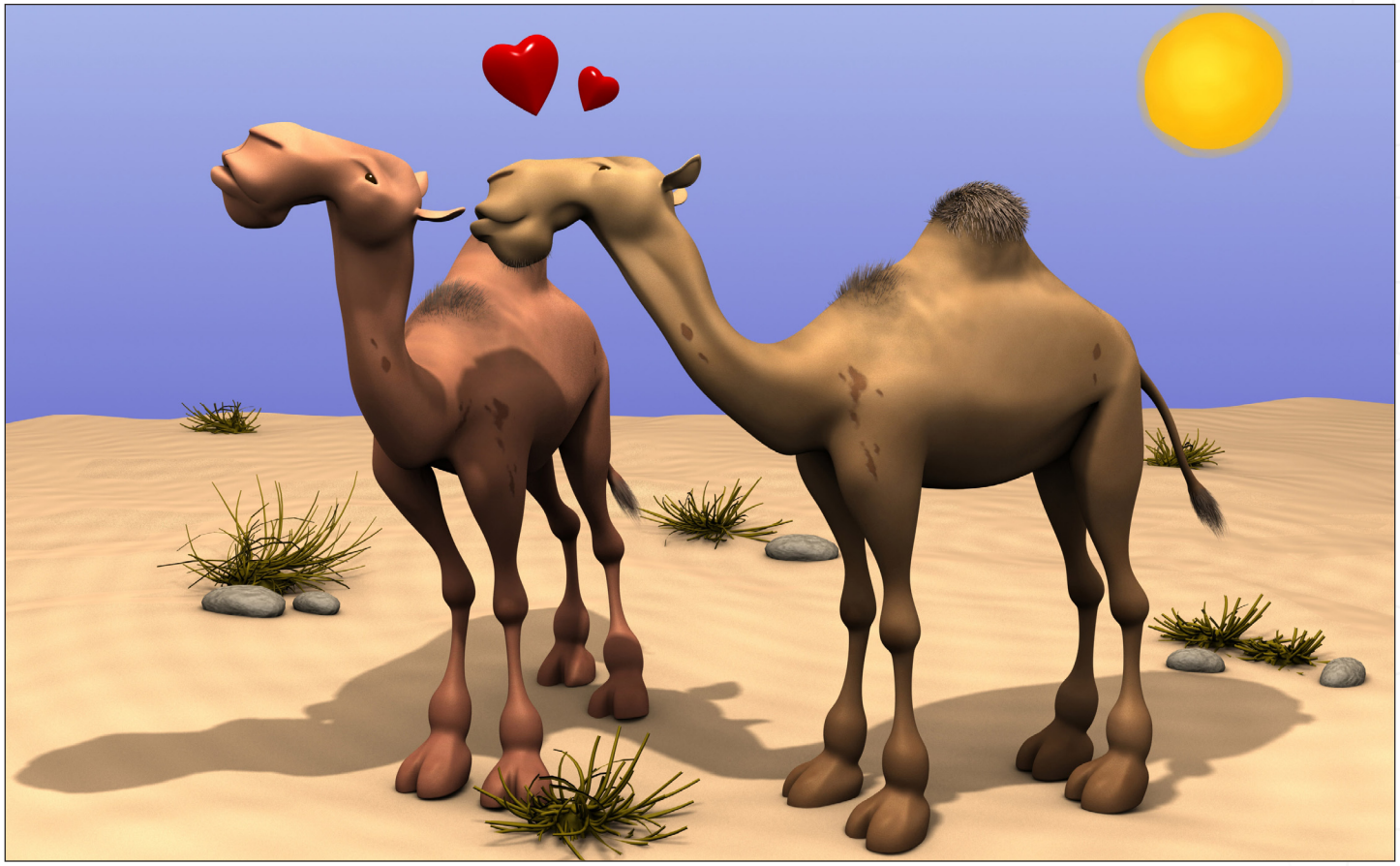
I used a light tracer for the illumination of the scene, with one skylight and one large spotlight for the sun that generates the shadows, although the direction of the spotlight is not relevant to some objects in the scene. Some objects, such as the hearts and the sun, do not cast shadows of course.

Rendering and Post Work:

I used Max's default Scanline renderer to render the image, and then a little colour correction and post work was done in Photoshop, like adding text and borders. I am thankful to all that have been involved in this challenge, and I hope that you have enjoyed this Making Of.

Shahin Fathi Djalali

You can contact this artist at: shahin_fj@yahoo.com

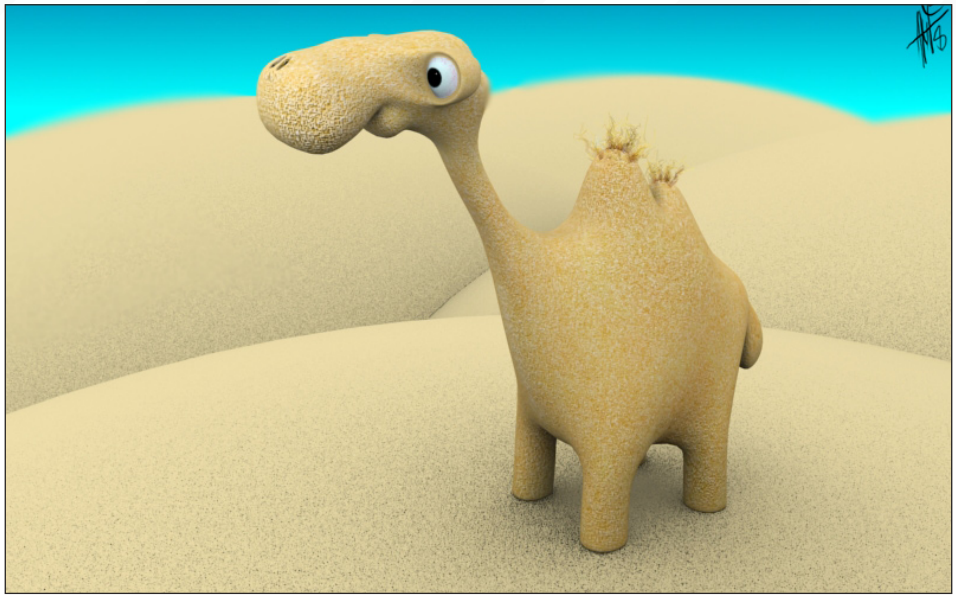


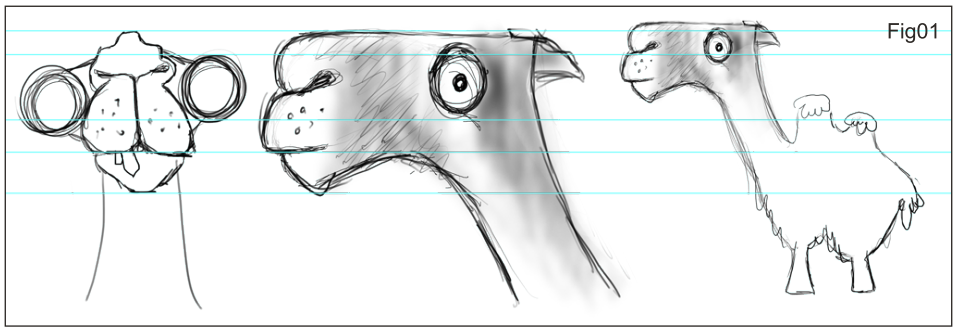


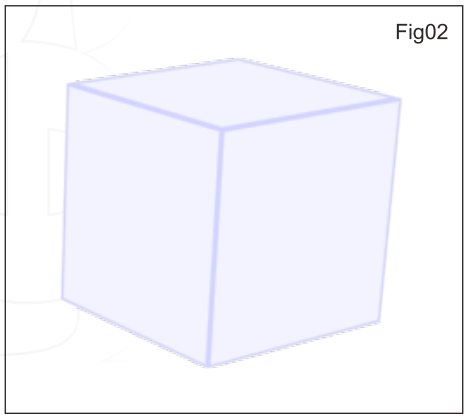
2ND - MIM ARMAND

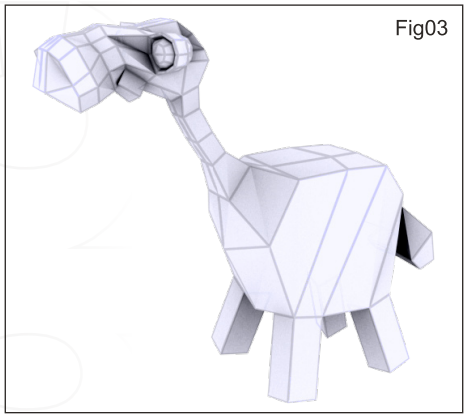
Hi, I'm Mim Armand, and here's the Making Of for my entry to the Stylised Camel Challenge - I hope you enjoy it!

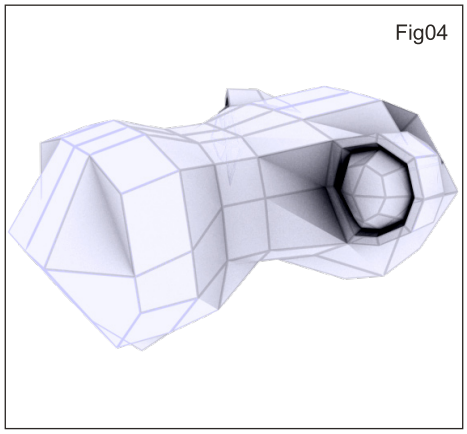
CONCEPT: I was so busy with my clients whilst the camel challenge was running on threedy.com but I didn't want to miss out on all the fun - so my entry was made pretty much at the last minute! I was still under the pressure of deadlines for projects, such as Dominance War II. So, I decided to make a really fast, but funny, camel - something that puts a smile on your face when you see it. I did a quick concept sketch (Fig01) and put it on the forum thread. These pages are a great way of getting good feedback from my friends, and they gave me more encouragement, so I then quickly started modelling...

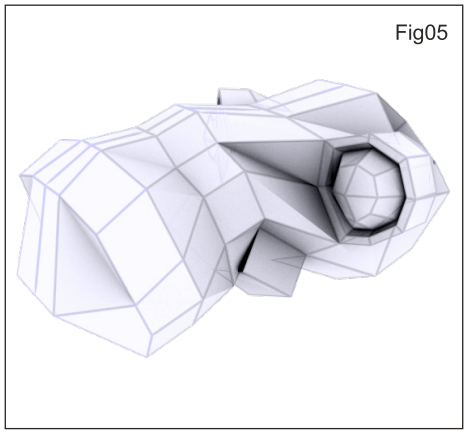


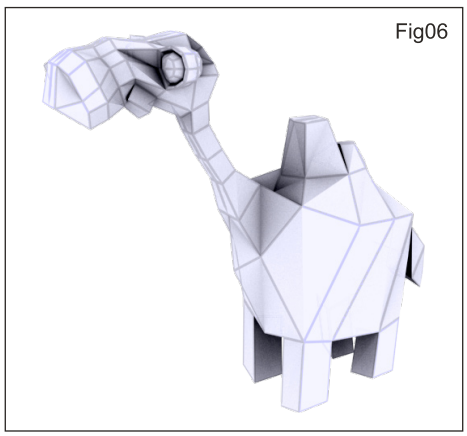

Fig01

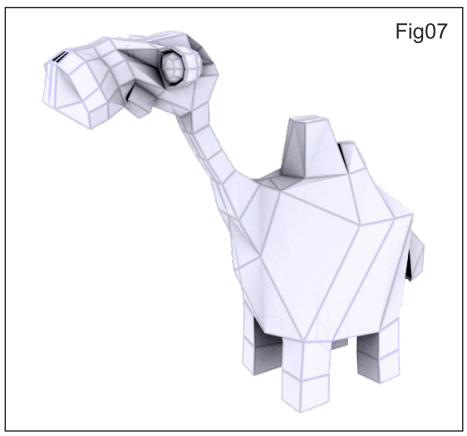

Fig02


Fig03


Fig04


Fig05

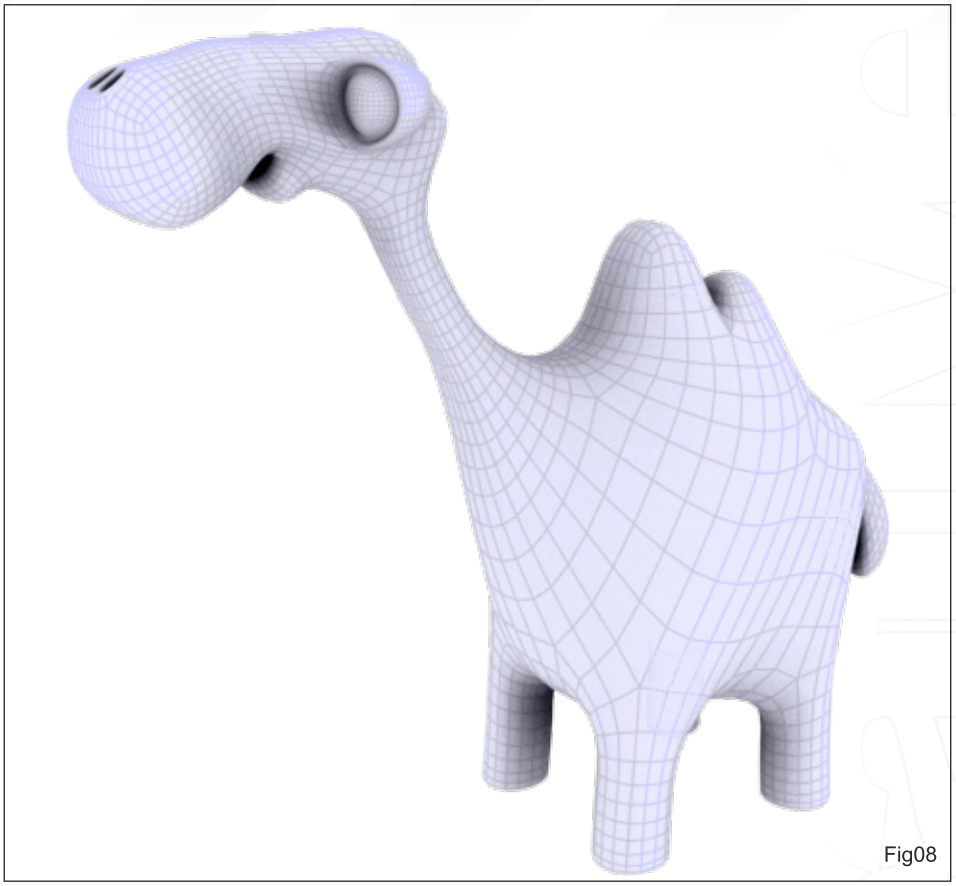

Fig06


Fig07

MODELLING: (Fig02 - 08)

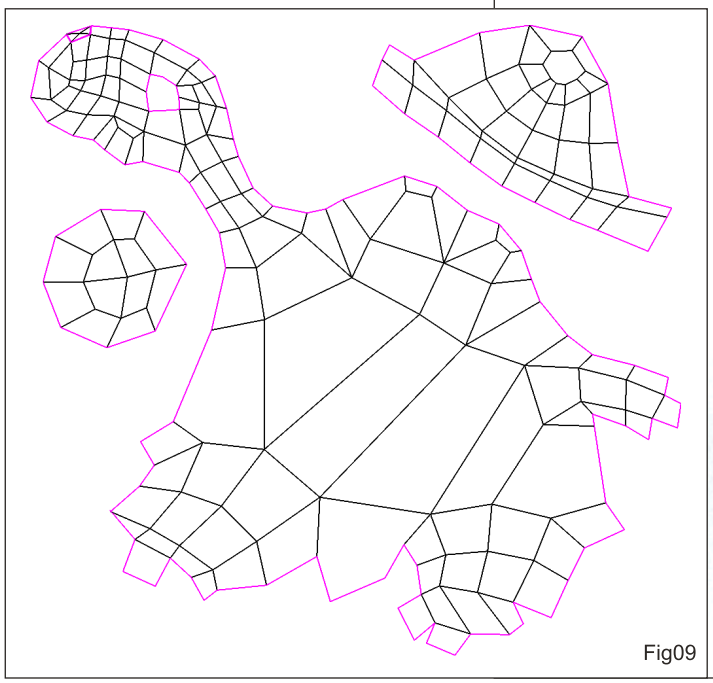
I started modelling with a box primitive and by quickly dividing it; tweaking it and making the

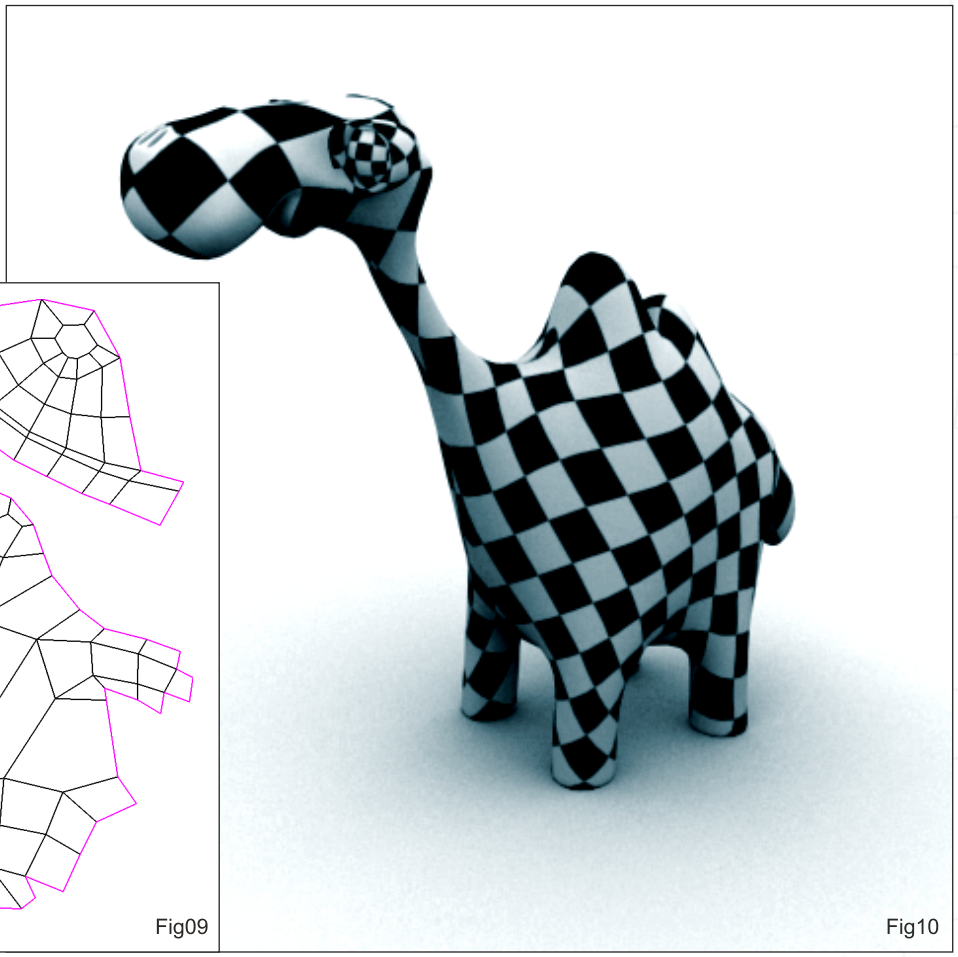
head using my sketches as reference. As time progressed I found myself veering away from the concept more and more, making small changes here and there for a better overall finished model. I completed the head in about an hour, with about 194 triangles (94 polys). When the head was finished, I began to form the body by extruding a face from the head to be the neck, then continued working on it, making some more polys and creating a general body shape according to my original concept. I then started to ignore the references again and tweaked it a little more according to my own gut feelings this time. The body took about 1 hour 30 minutes to model and I ended up with around 174 polygons, so this helped me to finish it on time and kept things simple, especially whilst unwrapping and posing the model. I later deleted half of the model and then added a symmetry and a meshsmooth modifier.


Fig08

UNWRAPPING: (Fig09 - 10)

Unwrapping was so simple and fast! You know, unwrapping a very low poly model is fairly simple and I managed it with almost with no seams - except for the eyes, which I thought may need more details than rest of the body. I then put UVs onto the texture space and enlarged them as much as possible.

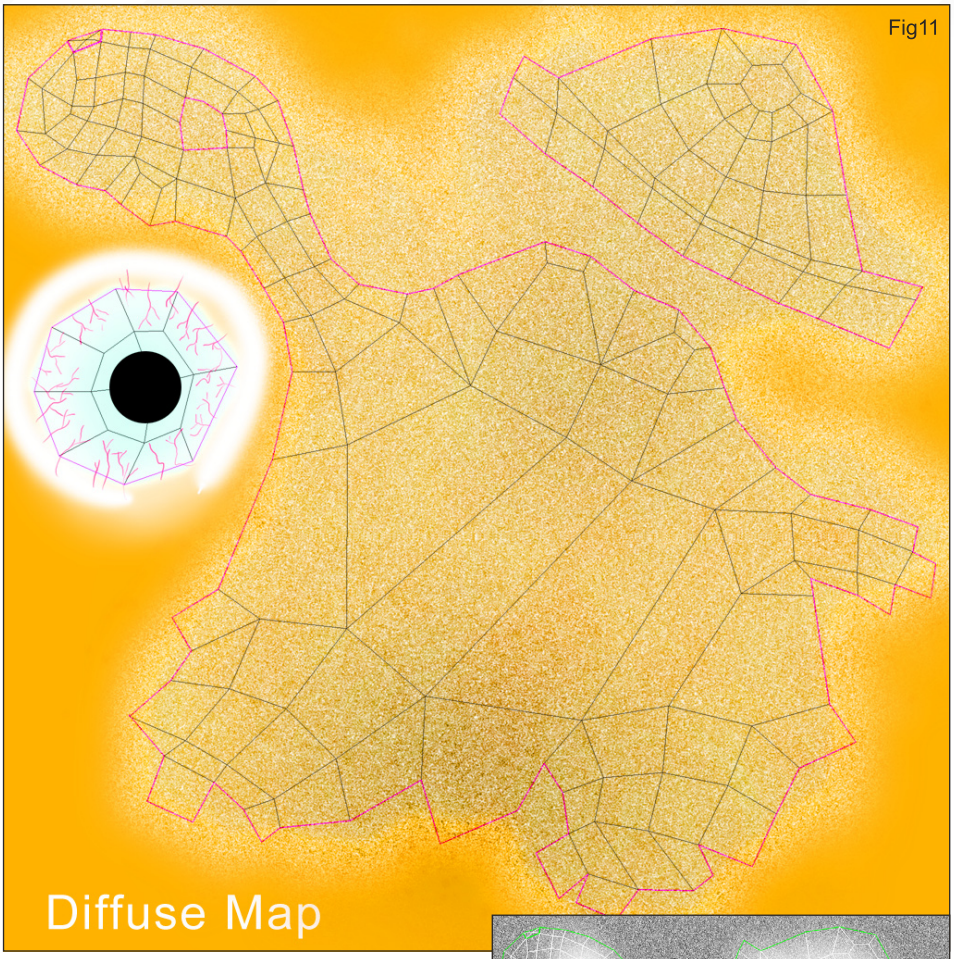

Fig09

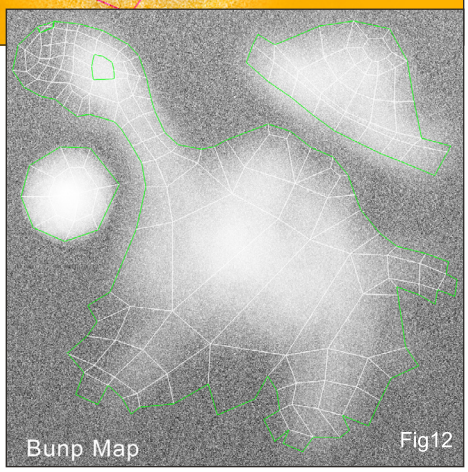

Fig10

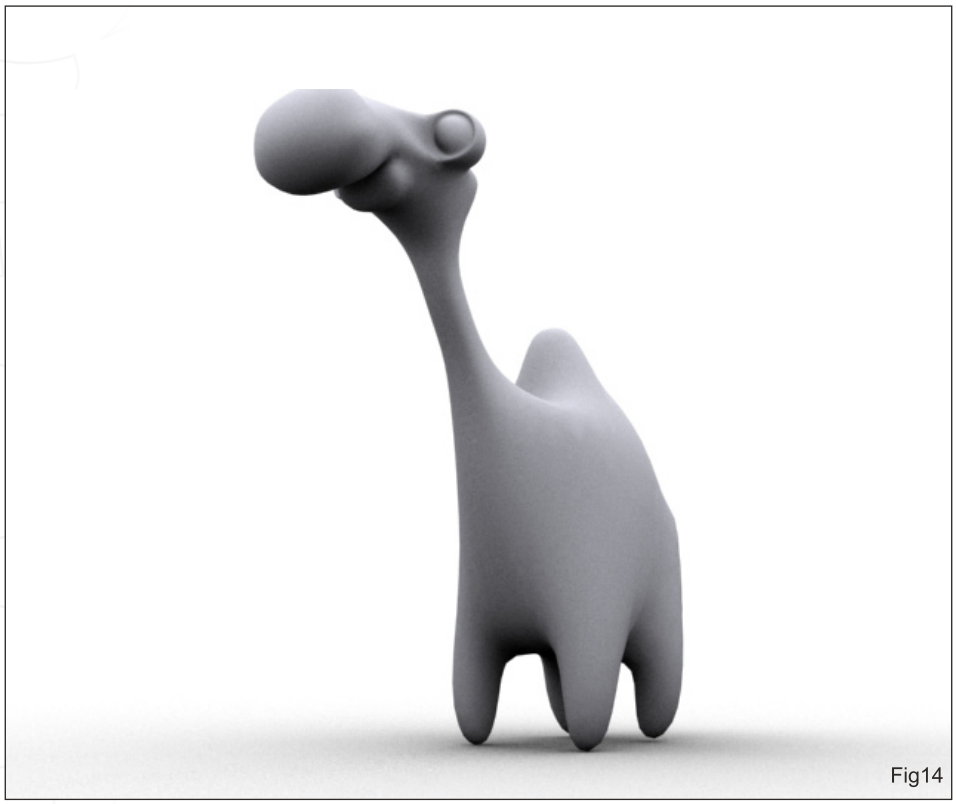


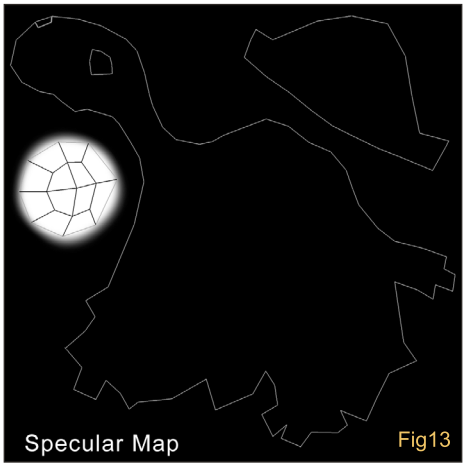
MAPPING: (Fig11 - 13)

The mapping was all done in Photoshop and a handy hint for this is to use the Alt and Tab keys to switch between Max & Photoshop. I quickly did some solid colour maps in Photoshop, then used the Smudge and Burn tools to make soft shadow-highlights on the map. I then added a solid layer on top and used the noise filter to convert it to a black and white noise layer, changing its blending mode to Overlay. Lastly I added an adjustment layer to control the hue and saturation of the map. This meant that I was able to change the colour and the look of the materials easily, by tweaking this layer only. This then became the “diffuse” colour map. I then made specular, bump, glossiness and s_level maps. The specular map was a simple solid black and white map, with an inverted colour on the eye UVs. For the bump map, I created a full noise black and white layer, then erased areas to make no noise or less noise. For example, I increased the noise for the nose area and decreased it for the “bulgey” bit around the eyes. Mapping and unwrapping took about half an hour or so in total.









Posing: (Fig14)

I'll let you into a secret here: I didn't rig it, I just tweaked the model about a bit and it was done. I tried a few other angles also, but eventually I decided that the angle I had started with was actually the best!

Final Touches: (Fig15 - 16)

I added some ugly hi-resolution humps to him at the end. I selected the top polygons of the humps after the meshsmooth, then added a Hair and Fur modifier and played with the settings to achieve something laughable. I didn't use an additional pass for this one because of the time constraints - I just hit a render and posted it!

Environment (Fig17)

For the sky I used a gradient map of cyan and a dark bluish colour. Adding some hemispheres as hills, I used a falloff map with two varieties of a brownish colour as diffuse, and noise as a bump map. And that's it! As you can see it's so simple and I don't really know if it required a Making Of or not, but I hope it was useful for someone at least. I hope to see you in the next challenge...



Fig15

Mim Armand

You can contact this artist at:
Armandcom@yahoo.com

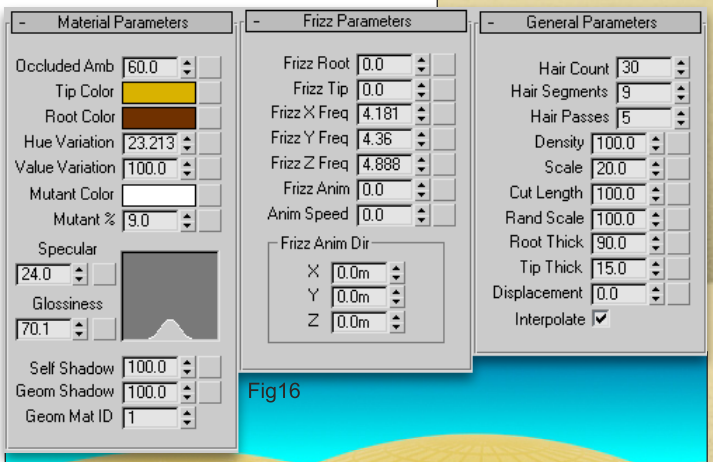


Fig16

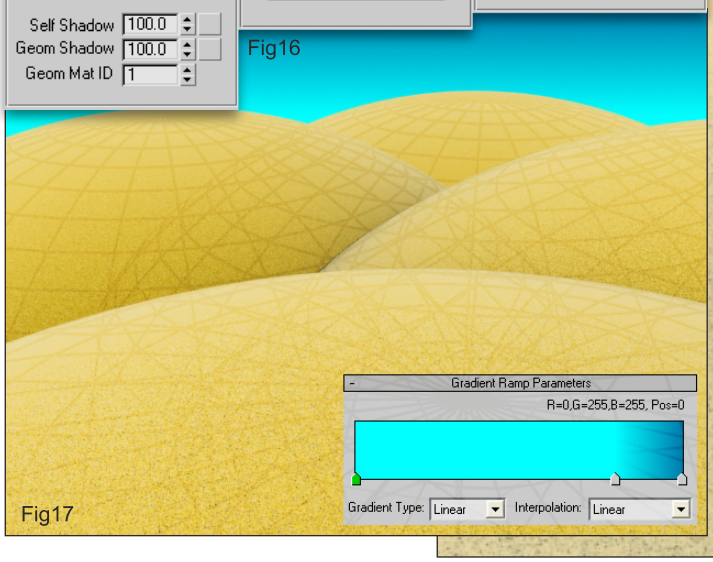


Fig17



1st - Khalid Abdulla AL-Muharraqi

We regret that due to personal reasons, Khalid has been unable to create the Making Of for his camel this month. We will however feature it in a future issue of 3DCreative magazine as soon as he returns. Many thanks for your patience.

Khalid Abdulla AL-Muharraqi

For more work by this artist please visit

www.muharraqi-studios.com

Or contact them at:

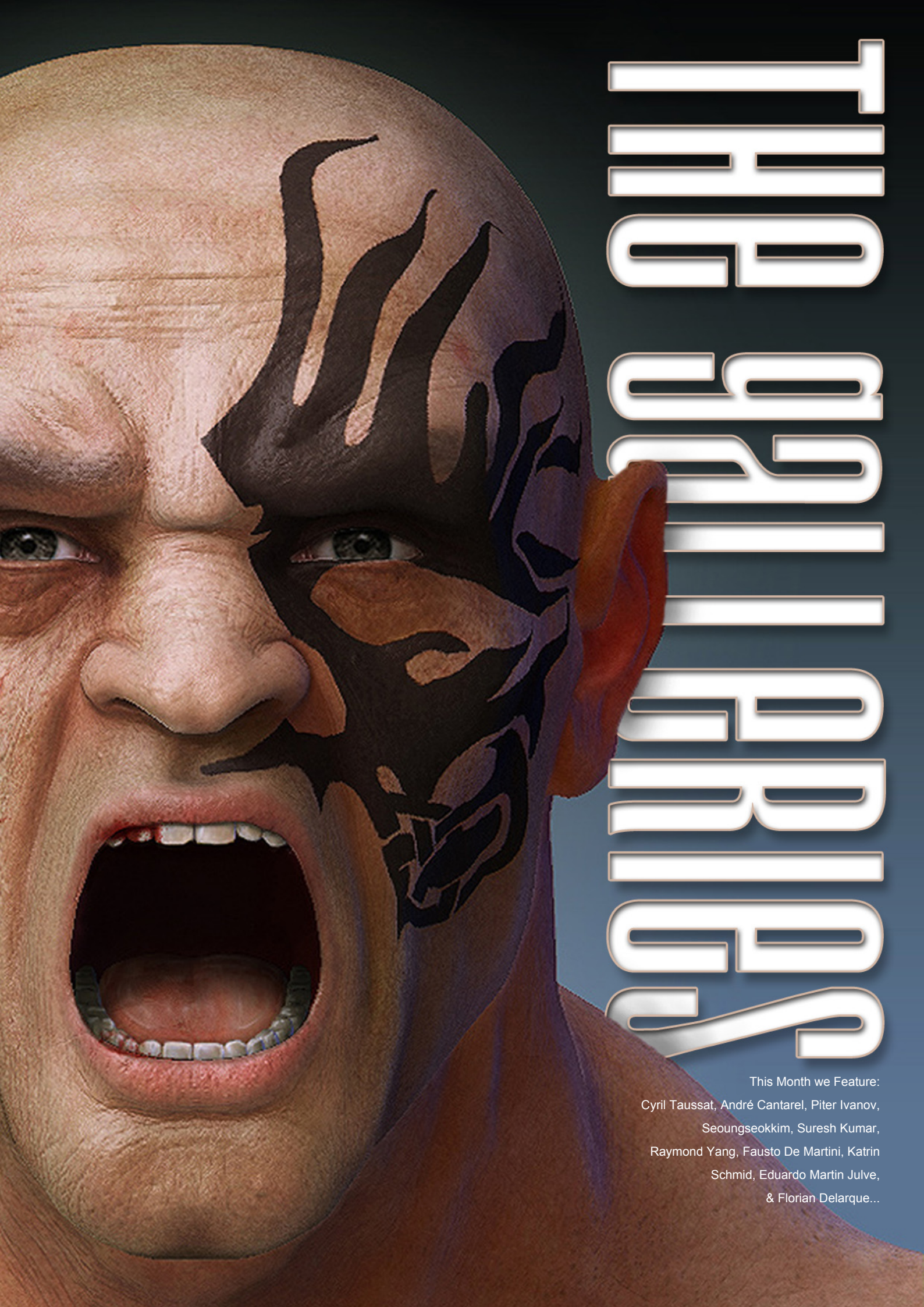
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The Gimp Magazine

This Month we Feature:
Cyril Taussat, André Cantarel, Piter Ivanov, Seoungseokkim, Suresh Kumar, Raymond Yang, Fausto De Martini, Katrin Schmid, Eduardo Martin Julve, & Florian Delarque...

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QUIET INTERIOR, LOUNGE OF MY RELICS

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Image courtesy of Optix Digital Pictures GmbH (www.optixdigital.de) and Neue Sentimental Werbefilm GmbH, Vienna, Director: Philipp Stölzl / Artist: André Cantarel www.cantarel.de

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Image courtesy of Optix Digital Pictures GmbH (www.optixdigital.de) and Neue Sentimental Werbefilm GmbH, Vienna, Director: Philipp Stölzl / Artist: André Cantarel www.cantarel.de

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theshortsdrawer DVD

A collection of the finest independent animated movies and commercial trailers. The Shorts Drawer DVD Collection has successfully included work from Students, Independent Animators and Commercial Studios. The aim being to enable you to view this wealth of elite animation in one convenient high-res package. The Shorts Drawer also serves to generate much needed exposure for these talented Artists and Studios.



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The aim of our training DVDs is to provide the artist with the most comprehensive set of lessons available. This is achieved by presenting the training material in the form of full screen step by step movies and audio instructions. The DVDs include on screen visual and audio instructions, ongoing forum support from the author, explanatory images and full screen resolution flash movies. All aspects of creating the finished projects are taught in a way artists can learn at their own pace.



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3DS Max Series v1



Modelling, Mapping & Texture Painting a Creature Head

3DS Max Series v2



Creating a Fighter Ship. Modelling, Mapping & Texturing

Maya Series v1

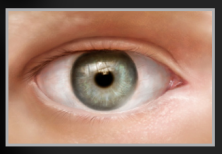


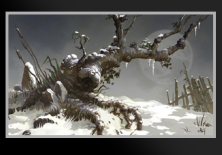
Modelling, Mapping & Texture Painting a Creature Head

other Training

Elements - ebook

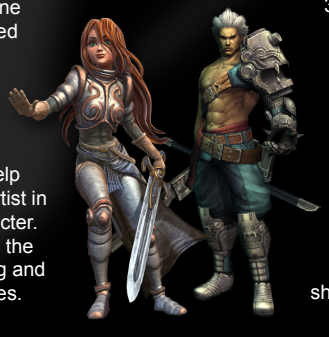
The 'Elements' volumes 1 and 2 are a 70 page guide to 2D Digital painting and can be followed in most software packages supporting paintbrushes and layers. With in this downloadable PDF EBook we have choosen some of the most used aspects of digital painting and asked 2 or 3 professional artists to cover a specific theme or 'element', resulting in 2 or 3 different styles and techniques which can be viewed side by side.





Joan of Arc - ebook

Michel Roger's famous 'Joan of Arc' tutorial re-written for Maya, Cinema 4D, Lightwave & Softimage. If there's been one single tutorial that has educated and inspired 3d artists than anything else, this complete step by step project must be it. These Downloadable PDF's are designed for ease of use to help beginners and intermediate artist in the creation of a female character. The tutorial takes you through the process of modelling, texturing and mapping to finally adding bones.



Swordmaster - ebook

The original character of the Swordmaster was created by Seong-wha Jeong and we had 3DTotal's in-house 3d artist Richard Tilbury, re-create the character in 3dsmax as well as create the textures in Photoshop, in our new 100 page, step-by-step tutorial for a highly polished, low polygon game character with a detailed texturing. This tutorials has also been converted into Cinema 4D, Maya, Lightwave and Softimage platforms. Even if you're not a user of one of them, the principles should be easily followed in nearly all other 3D applications.

Available from www.3dtotal.com/shop

TUC TUC











TUC TUC Is our new precise, step-by-step tutorial which will begin with a vehicle model and cover the principals of applying shaders, placing it in a simple scene & following with a two part section on both lighting and rendering. The tutorial will begin by creating and applying materials for the various parts of the car such as glass, chrome & tyres as well as texturing some simple geometry that will make up a scene. It will then move onto lighting where the focus will be on setting up a lighting rig and the various parameters connected to this. Finally the series will culminate with a section on rendering where the aim will be to finish with a polished image.

3DSMax Version
Page 159

Cinema4D Version
Page 168

Lightwave Version
Page 174

Maya Version
Page 184

Softimage XSi Version
Page 193

This Month : Part 5

RENDERING PART 1


"Our client list is quite impressive: Bioware, Crystal Dynamics, Dice, EA, Insomniac, Ninja Theory, Sony, Valve and many more"
Turtle™
We have spoken with Magnus Pettersson, the Head of Development for Illuminate Labs, about the release of Turtle 4. We also take a quick look at this new renderer with the tutorial "Ambient and Reflection Occlusion" which follows straight after the interview...
Sony Computer Entertainment Europe © Killzone Liberation



Turtle 4 is the only product on the market that combines advanced rendering technology with sophisticated baking functionality in a single integrated toolset. By integrating the baking functions into the core of Turtle, standard rendering and baking can be handled in the same way. For you, this means a better workflow while baking and the ability to bake with all of Turtle's render features.

What is the main purpose of Turtle?

Turtle is a plug in renderer for Maya, with a strong focus on game development. This means that we put a lot of effort into our baking / surface transfer functionality.

How does it compare to other similar products?

Very good, but then I might be a bit biased.

Since our focus is on game developers we make sure that we expose new lighting techniques for developers in an easy to use way.

What are the new features of Turtle 4?

We have extended our baking functionality quite a bit. There are now more advanced baking passes such as Radiosity Normal Maps, Spherical Harmonics and Directional Occlusion. You can also define your own baking passes using the LUA scripting language. This means that developers can easily extend the capabilities of Turtle. As well as standard vertex and texture baking, Turtle 4 also lets you bake information to point clouds (arbitrary points in space that don't need to be tied to scene geometry). You can bake any shading/lighting information to the cloud. On the standard rendering front we have a completely new 3D motion blur and a much revised 2D version. Other improvements include support for hair, a new super sampling algorithm, more control over FG/GI solutions and glossy refractions.

You have many satisfied clients so far, what titles has Turtle been used on and what was the response from the client?

As you can see on our web site our client list is quite impressive: Bioware, Crystal Dynamics, Dice, EA, Insomniac, Ninja Theory, Sony, Valve and many more. But impressive clients also come with great confidentiality… But I can tell you that Guerrilla Games is using Turtle throughout the whole Killzone asset pipeline and that Ninja Theory has used Turtle in its upcoming Heavenly Sword. They are both really happy about it and great Turtle fans.

Who specifically does turtle benefit?

Next-Gen game developers.



MAGNUS PETTERSSON

Head of Development

For more information please visit:

www.illuminatelabs.com

AMBIENT AND REFLECTION OCCLUSION

CREATED IN:

Turtle 4

You can download the demo project here!
You can get an evaluation license of Turtle at:
www.illuminatelabs.com

In this tutorial we are going to check out just how fast Ambient Occlusion in Turtle really is...

Ambient Occlusion is a trick invented by film makers to get an indirect illumination effect in a controllable way. For every surface point, you sample the surrounding geometry in every direction, and estimate how much incoming light is blocked from reaching the surface point. You can either use the data directly in your shader networks, bake it down into a map to avoid re-renders, or for game content.

Ambient Occlusion is a great tool for adding subtle shading to your images. It's difficult to tune your final gather renders to be really flicker-free, so approximating a similar effect with Ambient Occlusion maps is a great way to avoid flicker.

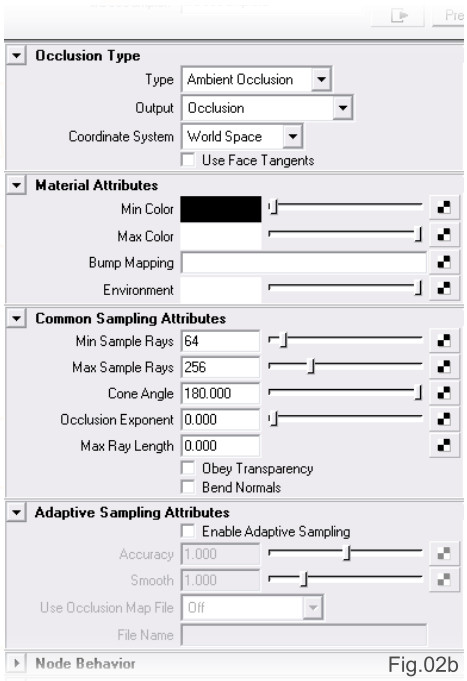
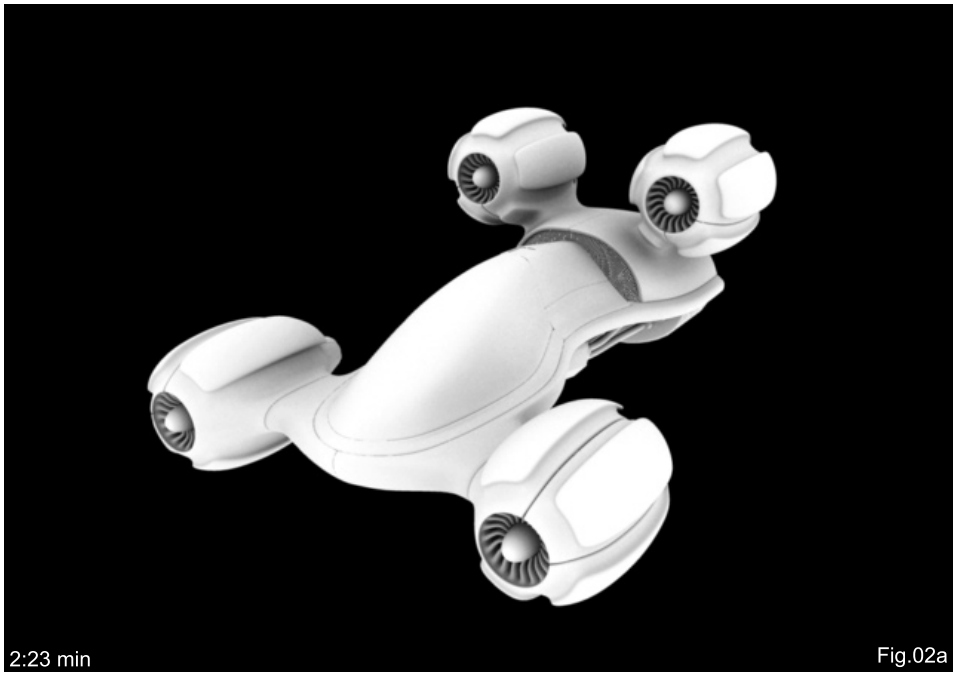


Fig.02b


0:23 min Fig.01


2:23 min Fig.02a

Go ahead and open the provided scene craft.mb in Maya and render out a frame. This scene is setup with a simple reflective Blinn shader, illuminated by some basic Maya lighting (Fig.01).

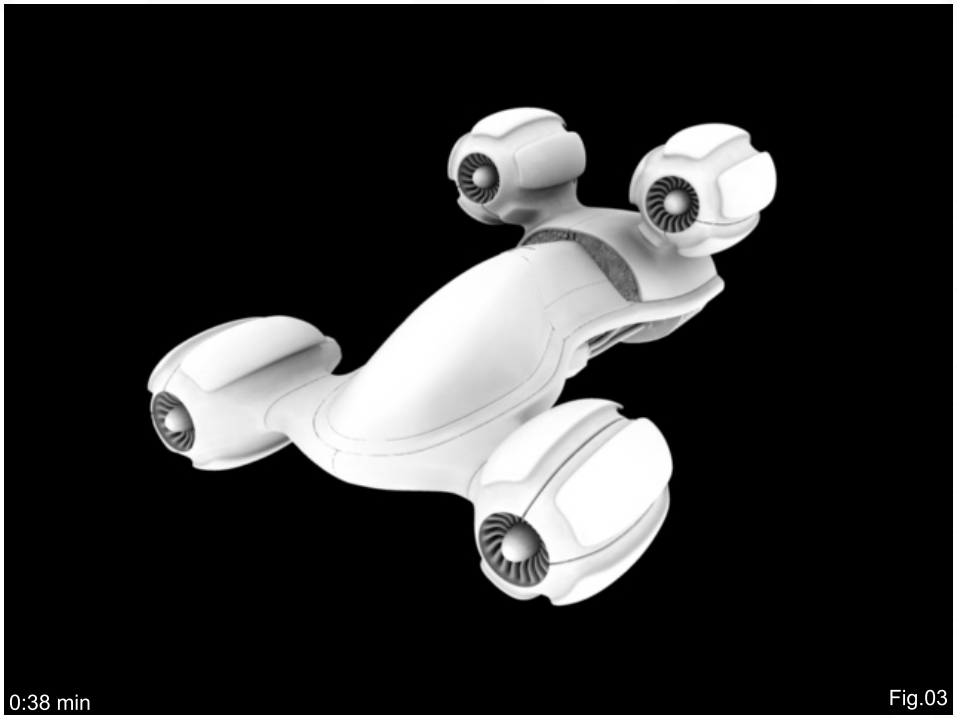
AMBIENT OCCLUSION

Select the craft group in the Outliner and assign the existing s_ambOccl shader to the surfaces. The Ilr Occ Sampler shader controls both Ambient Occlusion and Reflection Occlusion, but the defaults should be OK for now. You don't normally connect the shader directly as the main material, but it's a great way to get to know the attributes that control the shader. Fire up a render again (Fig.02a - b).

We get a really nice clay look in the render, but the render time increased a lot. For every sample in the image, Turtle is currently set to sample between 64 and 256 times to estimate the Ambient Occlusion. This is quite a lot of

sampling, but luckily, Turtle has a really smart mode where slowly varying areas can be less densely sampled, so that only detailed areas get a very high sampling. Go ahead and check Enable Adaptive Sampling and render out a new frame.

We get an almost identical image, but in a much shorter render time! Adaptive Sampling should really be enabled by default in the shader, so remember to always check it when you're rendering Ambient Occlusion. There's really no reason not to (Fig.03).



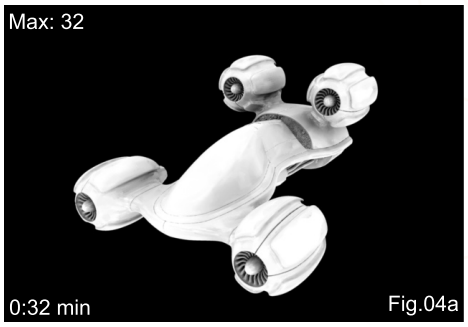
There are quite a lot of attributes to control the occlusion shader, but you really only need to remember and know a few of them for your everyday work. Attributes like Output and Coordinate System rarely need changing, since they let you write out different components or choose another vector basis for the output, so the defaults are fine for basic ambient occlusion. Use Face Tangents controls whether the coordinate space is interpolated from vertices, or calculated directly at the sample point. This too will only matter if you specifically need Face Tangents for some reason in your project, otherwise, don't worry about it.

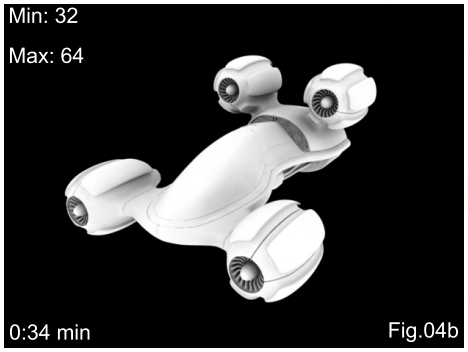
Material Attributes

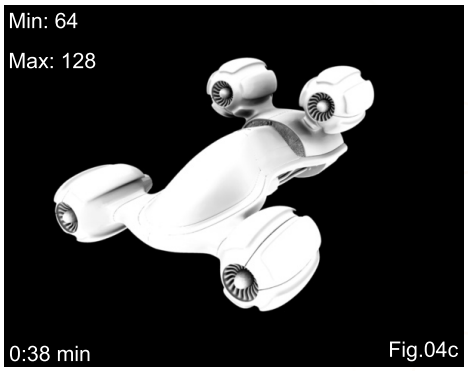
The trick with Ambient Occlusion is that it's completely independent of materials and lighting in the scene, so you can reuse any baked Ambient Occlusion as long as the geometry remains unchanged. You still have some options with which to control output, however. You can, for instance change the colour gradient of the Ambient Occlusion with the Minimum Colour and Max Colour attributes. The Ambient Occlusion sampler does not normally honour any material attributes, but you do have the option to connect a bump map through the Bump Mapping attribute. The Environment channel lets you connect an environment shader for image based ambient lighting. You will also frequently use it together with Reflection Occlusion.

Sample Rays

For every Ambient Occlusion sample point in the image, the Sample Rays attributes control how many rays are used to probe the surrounding geometry. Turtle will automatically sample the optimal amount of rays between the Minimum Sample Rays and Max Sample Rays values. The default values of Minimum Sample Rays: 64 and Max Sample Rays: 128 are in most cases a good start. If you go lower, you will notice an increase in noise. You might notice that to retain finer details, you will have to raise the sampling for final renderings. Even Minimum Sample Rays: 512 and Max Sample Rays: 1024 is pretty fast with the Adaptive Sampling mode (Fig.04a - c).



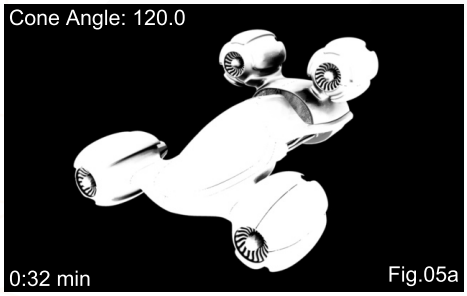


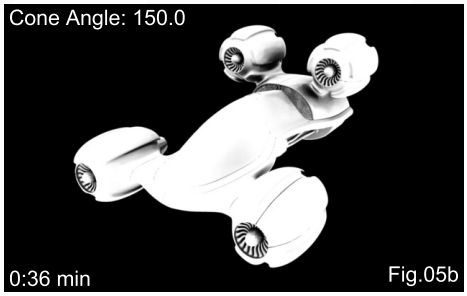


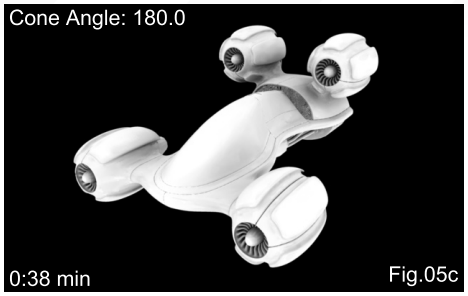
Cone Angle

The Cone Angle limits the distribution of the Ambient Occlusion rays. The default value of 180.0 sends rays in the hemisphere above the surface point. You can tweak the value to get a more limited ambient occlusion effect, so try out a few renders and see what look you like (Fig.05a - c).

There are some more attributes here, but you'll rarely touch them. Occlusion Exponent can be used to boost the Ambient Occlusion gradient,





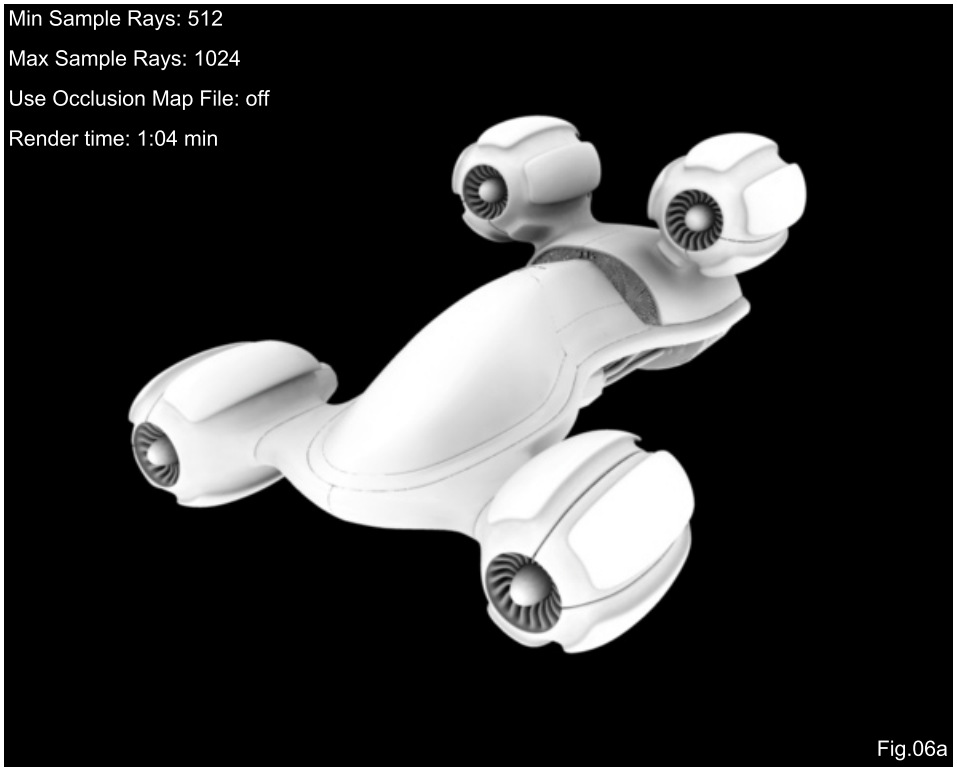


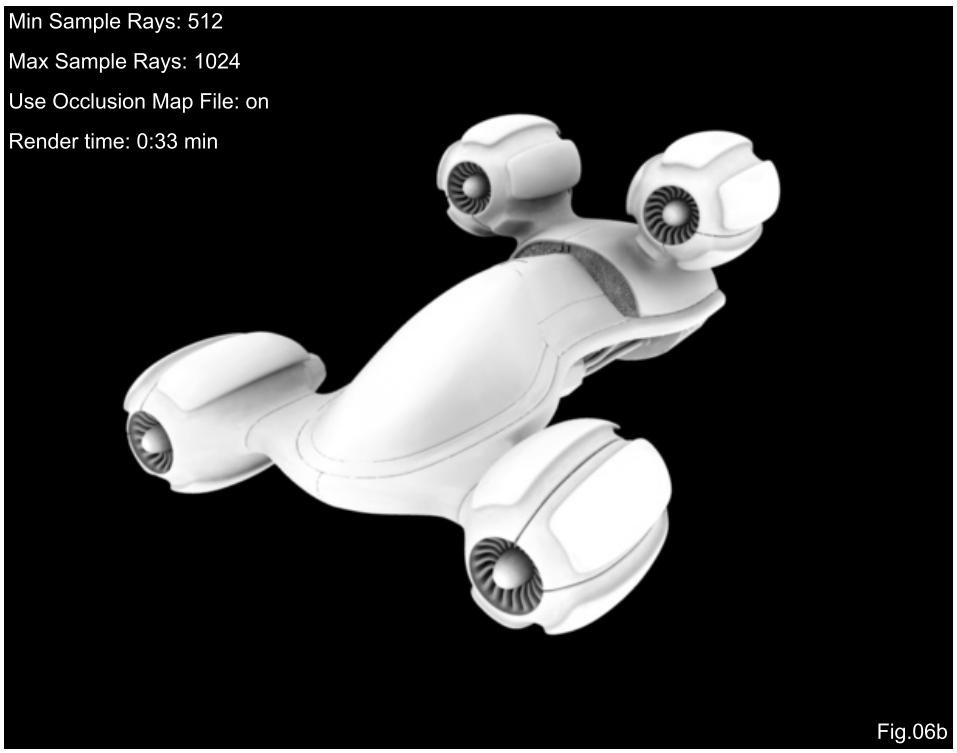
so that the transition from Minimum Colour to Max Colour is sharper. Max Ray Length is set by default to 0.0, which means that there is no restriction on how far Turtle will sample Ambient Occlusion in the scene. By actually setting it to a low value, you will reduce the render time, because Turtle will be able to skip sampling earlier. Check Obey Transparency to see if there are transparent surfaces such as glass in the scene, otherwise surfaces might be improperly shaded. Bend Normals is important if you are out-putting vectors. By enabling this function, the vectors will change from the surface normals to the dominant incoming light direction, which Turtle estimates through the occlusion samples.

Adaptive Sampling

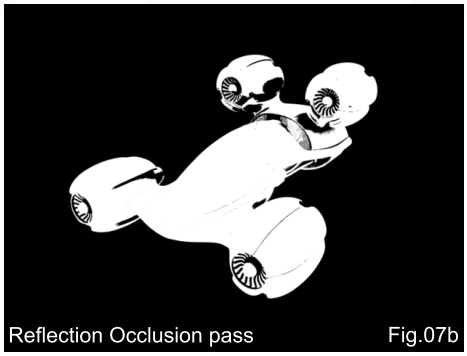
The Adaptive Sampling mode works exactly as a Final Gather rendering, it runs a rough pre-pass and samples Ambient Occlusion adaptively. During the final rendering, the Ambient Occlusion values are interpolated from the pre-pass results. You control the detail of the pre-pass with the Accuracy attribute, and the smoothness of the interpolation with the Smooth attribute. The Accuracy and Smooth values are still dependent on each sample point being sufficiently sampled, so a high Accuracy or Smooth value can not counter low Sample Rays settings.

One of the coolest things about using Adaptive Sampling is that you can automatically reuse earlier Ambient Occlusion data. Simply change the Use Occlusion Map File to Reuse or Reuse or Append, and you will reuse previous calculations in your next render. You will notice the most savings in render time when you are using quite high Ambient Occlusion settings. Remember however, that you can only reuse calculations for static objects (Fig.06a - b)!






Environment Map Fig.07a


Reflection Occlusion pass Fig.07b


Refl Occl * Environment Map Fig.07c

Use the Adaptive Sampling mode whenever you can; remember to check Reuse and append as well, since this will save you precious render time.

Reflection Occlusion

An often used production technique is to fake reflections with environment maps, without actually ray tracing. One of the drawbacks to this method is that the reflections will show up in every part of the surface, even though some areas might be occluded by the object itself. A common work around is to render out another pass, which masks out the occluded areas, a pass that is commonly referred to as a Reflection Occlusion pass. The generated images will look pretty close to Ambient Occlusion, but there are subtle differences in the sampling. Ambient Occlusion always samples in a cone around the normal of the sampled surface, whereas in Reflection Occlusion, samples are distributed in a cone around the reflected camera ray from the sampled surface.

Assign the existing material s_refOccl to the craft surfaces and hit render. The Cone Angle is only 10.0 degrees, so the transitions are quite sharp, but for highly reflective objects, rays don't scatter much. If you change the output to Environment * Occlusion, you will immediately see how the Reflection Occlusion will affect an environment map. Try setting both Minimum Colour and Max Colour to white in order to remove the Reflection Occlusion map temporarily (Fig.07a - c).

If you check the Render Settings, notice that in the Ray Tracing roll-out, the Reflections setting is set to zero. This means that Turtle did not ray-trace any reflections at all, so if we were to render out the Reflection Occlusion pass as a sequence, we could reuse it later without ever ray tracing the reflections in the ship.

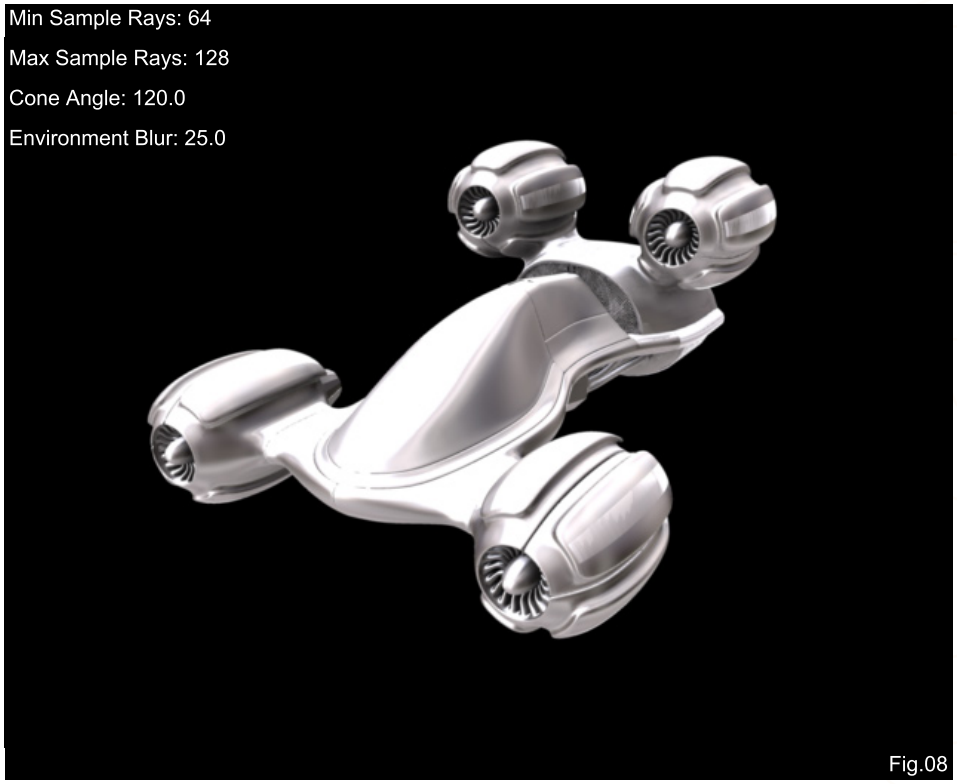


Fig.08

As you might have noticed, the Adaptive Sampling attributes in the Occlusion shader are all greyed out when using Reflection Occlusion. Adaptive Sampling does not apply well to rendering Reflection Occlusion, but luckily, you can lower the Sample Rays values quite a bit when the Cone Angle attribute is small. If you notice the s_refOccl shader, Minimum Sample Rays, and Max Sample Rays are set as low as 12 and 24, and this still gives quite good results.

Blurred Reflections

You can pair a larger Cone Angle with a pre-blurred environment map to create a convincing glossy reflection effect. Never blur the image inside Maya, as this will cost you in render time, so always remember to pre-blur in HDR Shop or a similar tool (Fig.08).

Putting it all together

You are usually best served by dividing your work into passes when you want to use Ambient and Reflection Occlusion, and then compositing all the components in a stand-alone compositing application. Just for simplicity's sake, we'll connect the equivalent inside Maya, but for production work, this is not recommended.

Select the craft group and assign the existing shader s_blinn. Open the hypershader and drag s_blinn, s_ambOccl and s_refOccl to the work area.

Connect the outColor of the Ambient Occlusion shader to the ambientColor of the Blinn shader. Connect one of the outColor components of the Reflection Occlusion shader to the reflectivity of the Blinn shader. The output of both Occlusion shaders goes as high as white, which is too high for both the reflectivity and the ambient colour, so change the Max Colour of both shaders to HSV: 0.0, 0.0, 0.25 (Fig.09).

We're going for a sharp reflection look, so make sure that the environment map is unblurred, and the Reflection Occlusion Shader is set back to Minimum Sample Rays: 12, Max Sample Rays: 24 and Cone Angle: 10.0. If you want to adjust the ambient colour, it might be better to mix a colour input with the Ambient Occlusion shader, but this is sort of a simplified version, where we directly set the Ambient Colour through the Minimum Colour and Max Colour of the Ambient Occlusion shader. Render out a frame now and save it in the Render View. Set the Minimum Colour of both Occlusion shaders to HSV: 0.0, 0.0, 0.25 so that the Occlusion shaders will output a constant colour, i.e. switching off the Occlusion contribution, and render out another frame (Fig.10a - b).

For the final render, we boost all the Sample Rays values of the Occlusion shaders and raise the resolution to 1280x960. Still no ray tracing except for the Occlusion shaders (Fig.11)!

Turtle

For more about Turtle please visit:
www.illuminatelabs.com

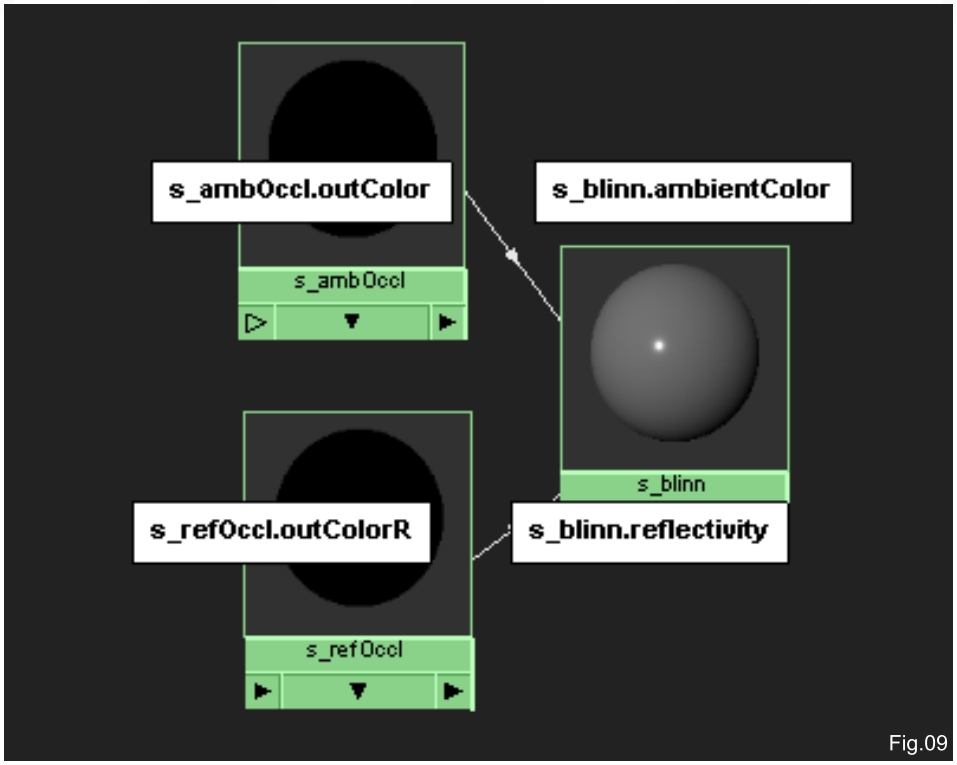


Fig.09

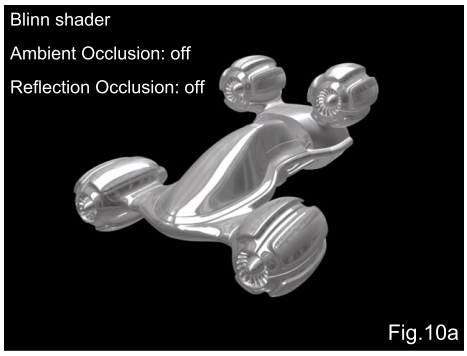


Fig.10a

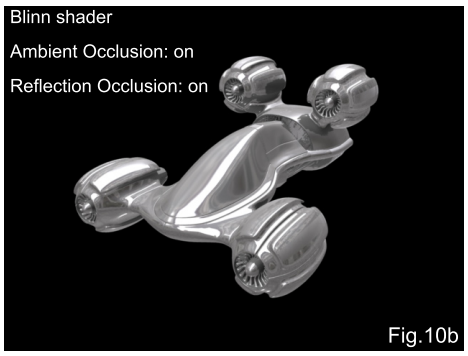


Fig.10b

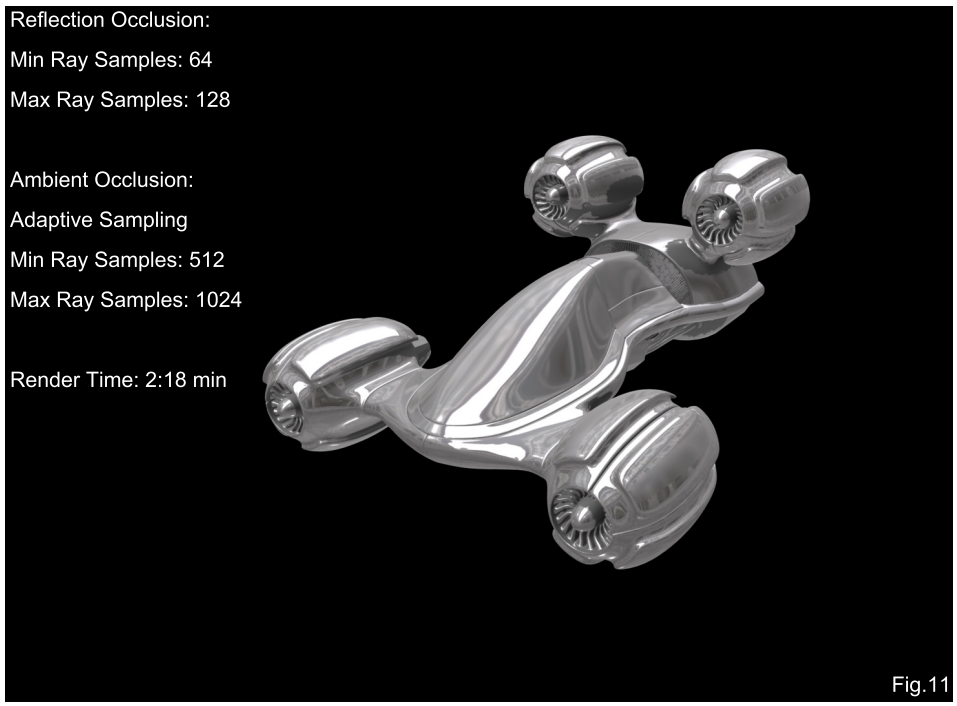
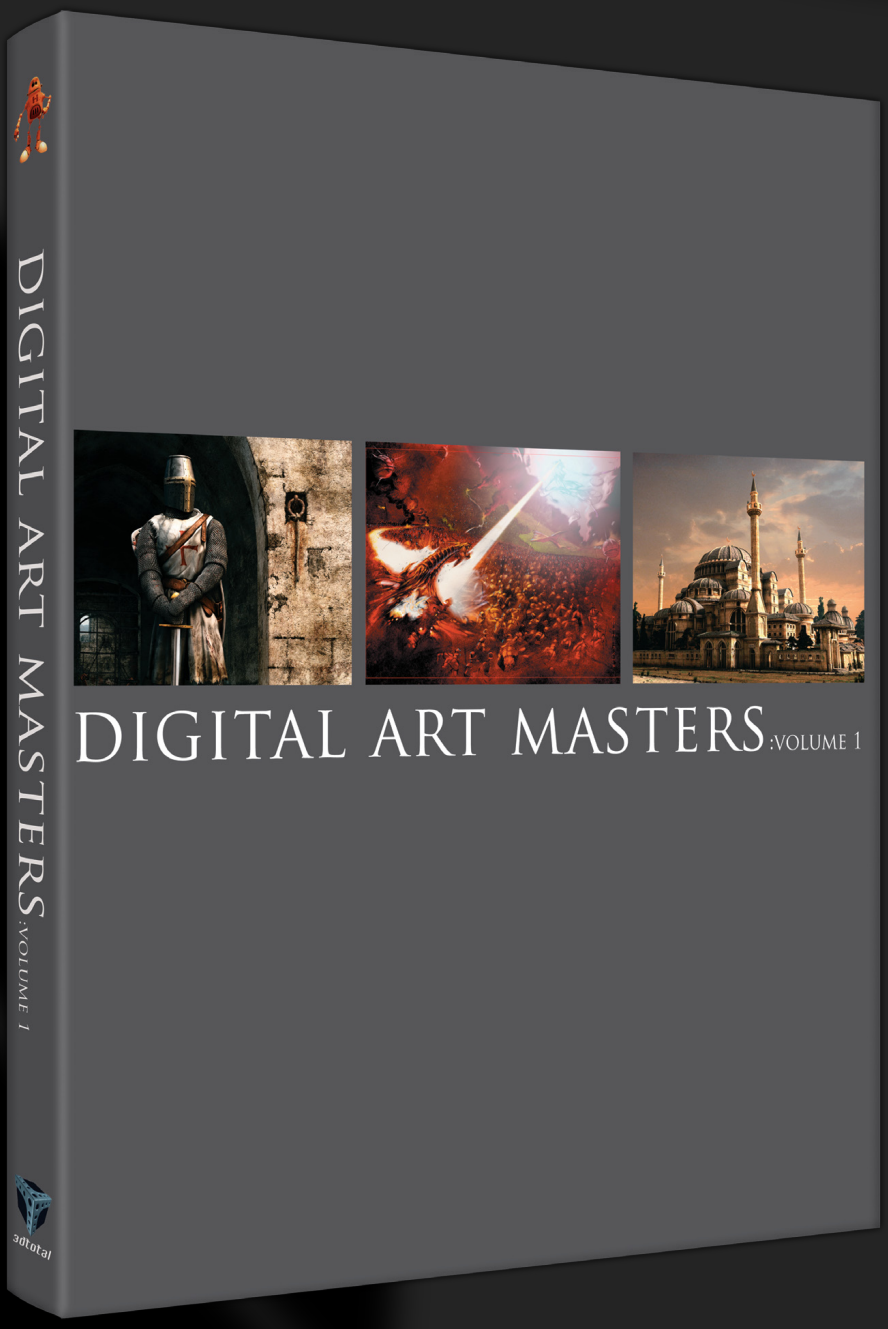


Fig.11

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Cesar Alejandro Montero Orozco gives us a very detailed tutorial into the “Lighting Basics”, taking us step-by-step through lighting, using LightWave...

lightwave

COMPLETE GUIDE TO LIGHTING

“If you want to break the rules, you first need to know what those rules are!”

Part 3: Lighting Basics

COMPLETE GUIDE TO LIGHTING

PART 3 : LIGHTING BASICS

CREATED IN:

LightWave

BASIC LIGHTING TOOLS INSIDE LIGHTWAVE

Before we get started with the tools for lighting inside LightWave, it is important to review some of the theory behind it. As previously mentioned, light travels and hits objects directly. It then bounces and hits other surfaces. Rays that hit first are called “Direct Lighting”. Further bounces of light are called “Indirect Lighting”. LightWave has tools to produce both. There is a set of lights to produce Direct Lighting, and rendering parameters to make further Indirect Lighting bounces. This approach is render intensive. To compensate for this, LightWave has another set of tools to produce, and fake, Indirect Lighting. Balancing both will eventually make you a better lighting artist. Therefore, let’s cover some of the basic tools to produce both types of lighting...

OPENING LAYOUT

The default settings: each Layout scene contains two items by default - a light and a camera. Cameras are used to render images, and lights are the main elements inside Layout to produce Direct Lighting (or fake Indirect Lighting). You need at least one of them in order to create a render. The following image shows the light being selected. Light icons in your scenes will appear in hot pink, and when you select them, they will turn yellow. Cameras will be shown in green. Use the viewports to translate, scale and rotate them as you wish (Fig01). Use the <F9> key to render. You will be able to render right away. The default lighting settings are by far a setup used to produce nice

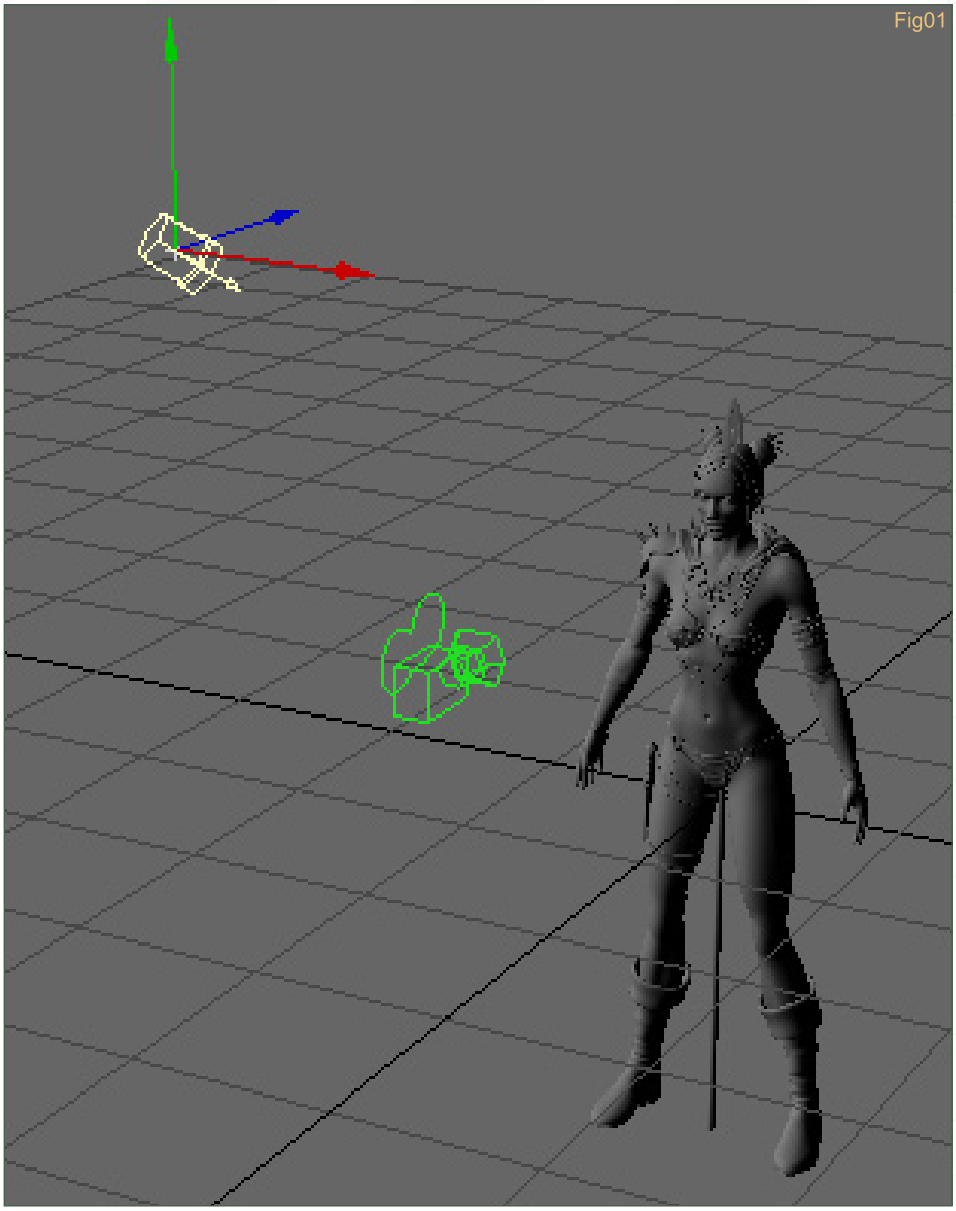


Fig01

images; shadows will not even render. So let’s explain some basics tools to start getting nicer images. If you select your light, and press the <P> key, you will open up the Light Properties menu of the light. The Light Properties is a pop-up window with many parameters organised into several sections. So let’s explain each one of them...

THE LIGHT PROPERTIES PANEL

The top section includes information regarding the Ambient Lighting. Ambient Lighting is light that can be evenly added to all of the polygons in your scene. This property always appears on top when you open up the Light Properties window. Keep in mind it is a global property, and it is not an individual light property. Global Lighting properties affect all of the objects inside your scene. Individual properties affect the lighting produced by each individual light tool.

WHAT IS AMBIENT INTENSITY FOR?

This is not a required value in order to produce any kind of lighting. It is however a handy feature, which is commonly used to produce fast (but fake) Indirect Lighting. For better results, it is used along occluded textures (this theme will be covered in further chapters), or just for tweaking and giving some missing tints of light to a scene.

WHAT IS THE IMPORTANCE OF INDIRECT LIGHTING?

To keep it simple, there is Direct Lighting, and there is Indirect Lighting. The first rays of light that hit an object constitute our Direct Lighting. Light in real life bounces after it hits, and therefore further illuminating surfaces. This is not a default feature in most 3D applications, since the calculation of the bounces normally take a long time to render. Therefore, Indirect Lighting is created separately. Indirect Lighting is indispensable to create realism. It is, in great part, what makes a render look 'real'. Light bounces, shading and painting the environment in an infinite balance that can be expressed both artistically, and mathematically. Adding it to a scene therefore "glues" everything together, since it is a visual representation of balance. The more you learn about Indirect Lighting, the more you will know how light behaves, and therefore you will be able to understand how to duplicate it.

WHAT IS DIRECT LIGHTING?

Direct Lighting is the first set of light rays originating from a source that hit a surface for the first time. Direct Lighting does not include any further light bouncing. Therefore, the shading that results from Direct Lighting is normally not photo-realistic. Direct Lighting can however be used to imitate the bouncing of light, and to simulate Indirect Lighting. The following image (Fig02) shows a plane which has been lit with just Direct Lighting. In this render, we are using a light called "Distant Light" (more about types of light will be explained further on in this chapter). The Distant Light is reaching part of the plane, but the rest of the plane is in total darkness. There is no light reaching those parts where light is not hitting directly, and so the shadows are completely black. Our background sky is just a photograph in our background, and so it is not adding any light to our scene. We are therefore missing the atmospheric light - some blue tints on our plane (Fig03). In real



Fig02


Fig03



Fig04


Fig05

life, you get more than just the sunlight hitting hard. Sunlight enters the atmosphere, and bounces through the sky. This bounced light eventually reaches other parts of the plane. This is what we call "Ambient Lighting". There are many ways to create Ambient Lighting, but a cheap and easy way to achieve it is by using Ambient Intensity in the Light Properties panel (Fig04). The following image shows our plane being lit both by a Distant Light, and 80% Ambient Intensity. You will notice a great difference between this and the previous image, where all of the indirectly lit areas of the plane

Fig06

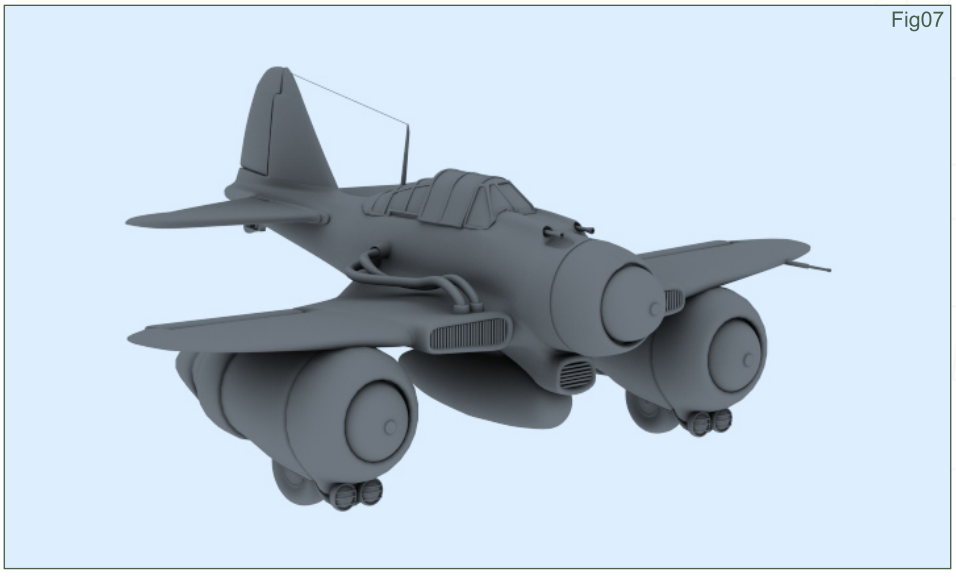


remained black (Fig05). There is a drawback to using Ambient Intensity in LightWave, because It adds the same light intensity to all of the polygons. It fakes Indirect Lighting but it does not fake indirect shadows. Shadows caused by Indirect Lighting constitute one of the most subtle and important shading elements in order to produce realism. Therefore, this feature should be used alongside other techniques in order to produce an accurate balance between light and shade. The following image (Fig06) shows the plane being lit by Ambient Lighting only. Notice that there are no shadows, and therefore no volume. The few senses of volume that we get, comes from the variation of the diffuse and colour values of the plane (Fig06).

How do I Create Indirect Lighting?

There are several ways to achieve this. A popular solution is to use the previously discussed Ambient Intensity alongside shadows produced by Ambient Occlusion (which will be

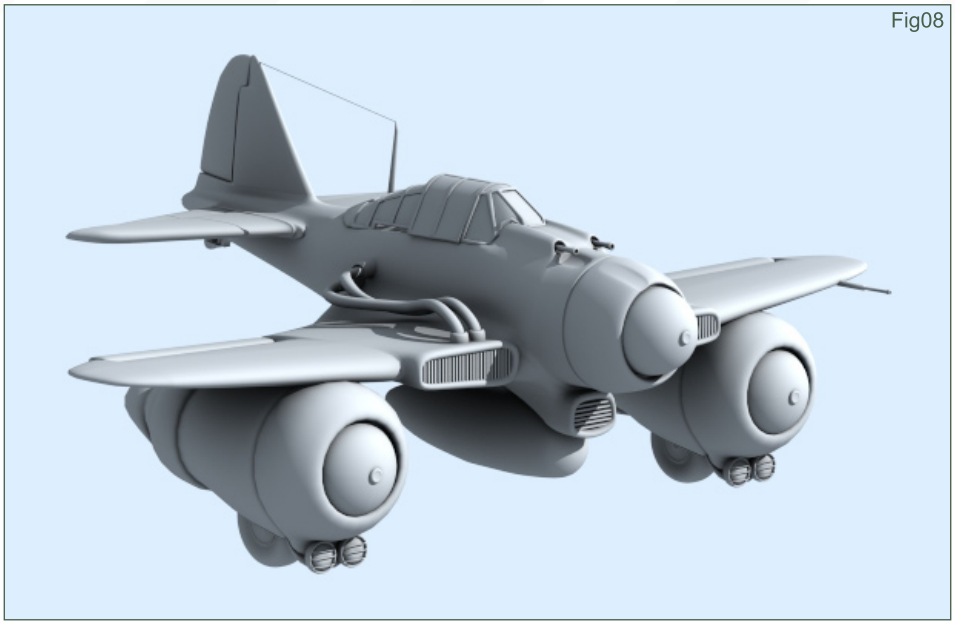
Fig07



discussed in the following chapters). You can use individual lights to reproduce the bouncing of light and to create indirect light and shadows. Another famous solution is to use a backdrop colour along with Backdrop Radiosity. This is a common, but render expensive, technique which is commonly used (the so-called “clay render”). In any case, keep in mind that Ambient Lighting can be achieved in many ways, and this feature is one that you can use, but it is not completely necessary, as LightWave offers us many ways in which to create it. The following image shows our plane being illuminated by a backdrop colour (Fig07). There are no lights used in this scene, but instead a single colour is evenly distributing light onto our plane. This technique requires the use of Backdrop

Radiosity. Notice the soft shadows that are created with this technique. It appears as if the plane is right inside a cloud (Fig07). Now let's see how the combination of direct and Indirect Lighting looks. The following image (Fig08) shows the same scene, but now includes our Distant Light hitting the plane. Notice that the soft shadows from the Backdrop Radiosity combine with the hard shadows of the Distant Light. This lighting setup resembles more of a daylight setting. It is still missing the correct light colouring, but the way in which the highlights and the shadows are behaving is much more like that of a sunny day (Fig08).

Fig08



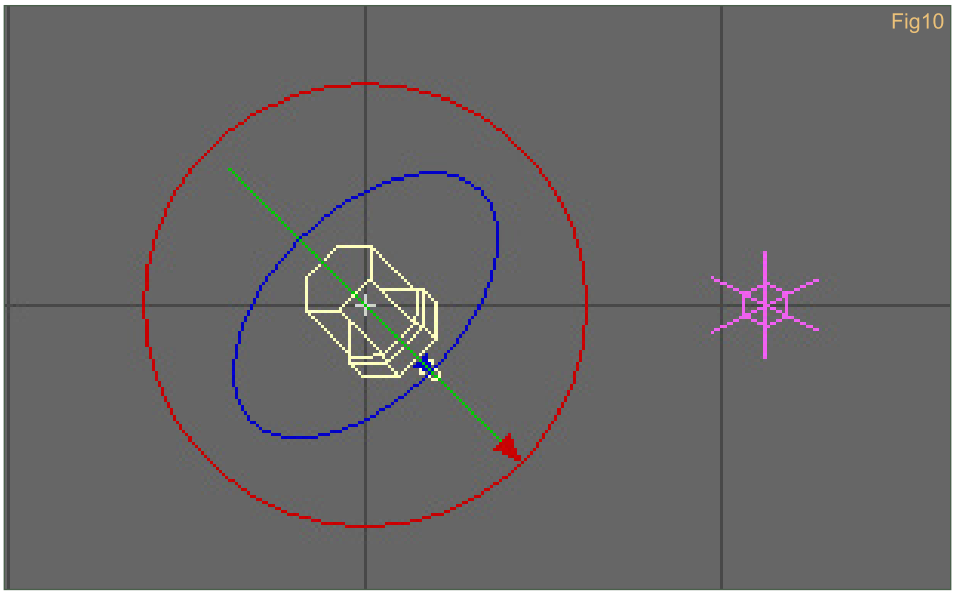
LIGHT PROPERTIES

The middle section of the Light Properties holds information about the currently selected light. These are the most important lighting parameters that will have the most impact on the look and feel of the light. The first parameter is the current name of the light being selected. By default, its name is called "Light". Click inside the text-box to change the name of your light. To its right, you will find a drop-down menu used to quickly select other lights inside your scene. If you want to view properties from another light, you just need to select it from this drop-down menu. Light Type can be set to: Distant Light, Point Light, Spot Light, Linear Light and Area Light. Each type of light produces different types of shadows and highlights. Then we have the Light Color set to white <255,255,255>, by default. Lighting Intensity dictates how intense your light is. You can have values under 0, and over 100%. Think more of it as a value than a percentage. Intensity Falloff is activated with all lights, except for the Distant Light. It is a drop-down menu with different options that will dictate how your light will fade away. This works alongside the Range/Nominal Distance. Let's now explain each of these features (Fig09) ...

Fig09



Fig10



WHY DO WE HAVE DIFFERENT LIGHT TYPES?

Having different light types allows more flexibility. You can achieve realism and emotion with any type of light; Distant, Point, Spot Light, Linear and Area. What varies is the number of lights that you will require, the amount of time to tweak them, and the amount of time to render the scene. Some lights will produce more realistic shadows, but will have higher render times. Others will produce fake shadows, but will have fast render times. Balancing the amount and type of lights used

Fig11



Fig12

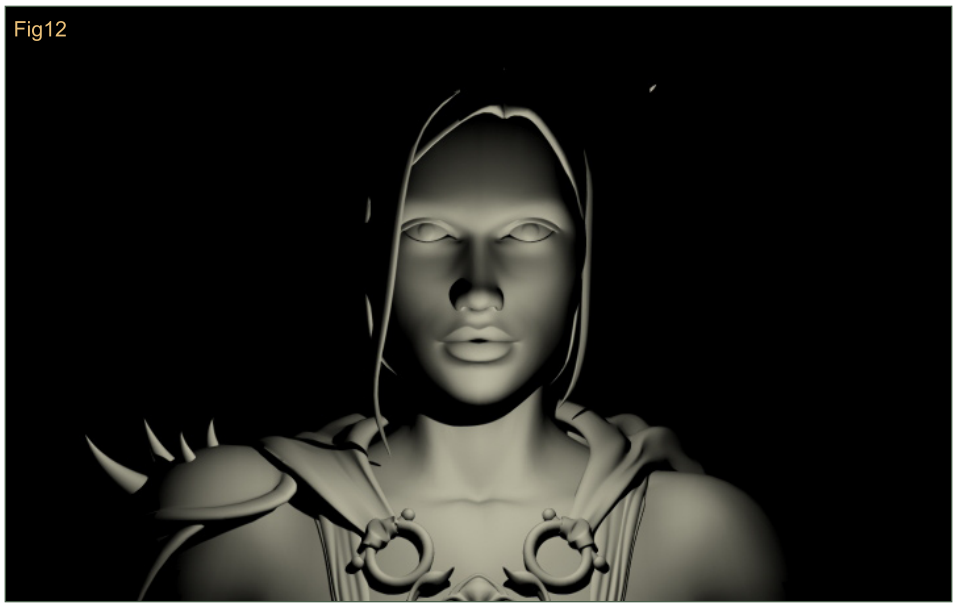


Fig13



in your scene is the key to attaining the results that you want, under the resource restrictions required (Fig10).

Distant Light

Distant Lights produce light rays from a single angle throughout your entire scene. When you position a Distant Light, it will be able to cover the entire scene, and all of its rays will have the same angle and direction. In other words, all the shadows produced will have the same direction. Shadows will be completely sharp. Totally sharp shadows are unnatural, because they don't exist in real life. All shadows have a certain degree of "fuzziness", since all lights have a physical size and dimension. Distant Lights fake the type of shadow produced by objects on a sunny day. Their sharp shadows may not be very accurate, but they are quick to render. When they are used alongside great texturing, you can come up with some great results without the need of higher rendering times (Fig11).

Point Light

Point Lights produce light rays in all directions around a single point in space. Fireflies produce a similar type of lighting. Their light comes from a single point, which reaches all of its nearby surroundings. How far will that light reach objects? That depends upon the Intensity Falloff and the Range/Nominal Distance value. Distant Light rays are infinite. Other types of lights as Point Lights can be constrained (Fig12).

Spot Lights.

These are the same as their name suggests; lights that illuminate spots. Point Lights illuminate all of its surroundings, from a single point. Spot Lights just light a slice, or a spot. You can vary the aperture of the Spot Cone Angle and the Spot Light Soft Edge Angle. These lights create shadows similar to those of a torch. But, of course, if you make the angles bigger, you can use them to produce many types of lighting conditions (Fig13).

LINEAR LIGHTS

Linear Lights emit light from a single line, all around their circumference. Fluorescent tubes have a similar effect to this in real life (Fig14).


Fig14

AREA LIGHTS

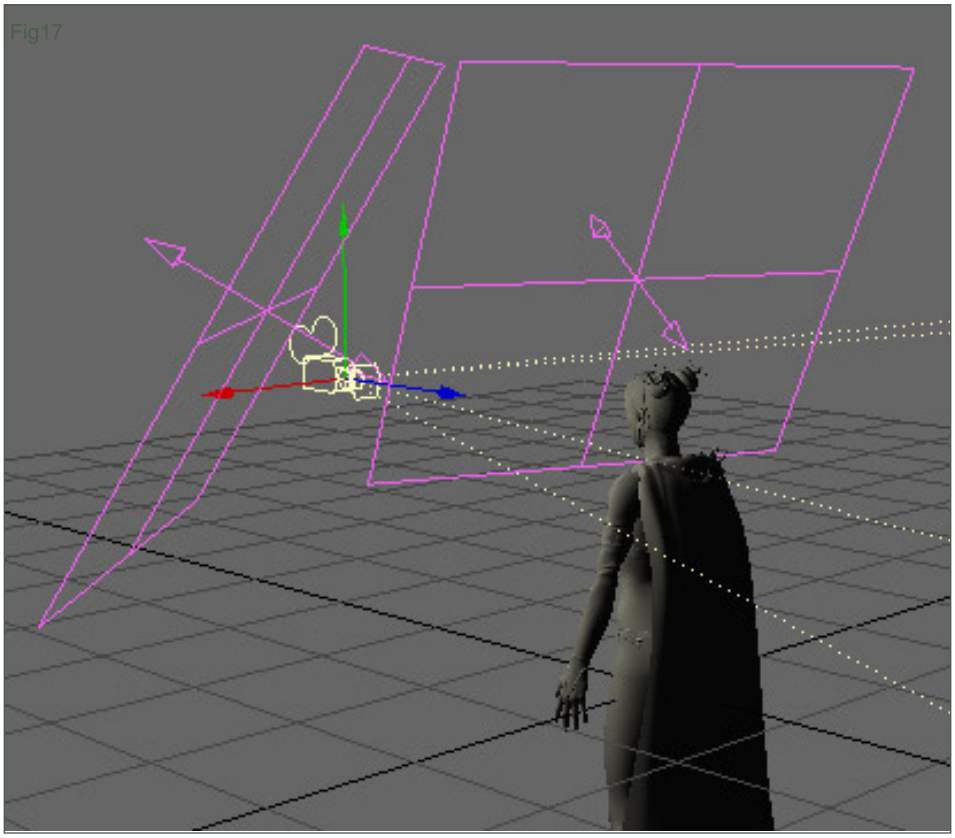
Area Lights are 2D planes that project light from both sides of the 2D plane. They work as “windows of light”, producing soft shadows. They are the most render intensive lights, but produce the softest shadows. The bigger the light, the softer the shadow. The bigger the light, the more render intensive it will be. You can alter the Intensity Falloff to vary how far the light will reach objects, and you can use the Range/ Nominal Distance to establish when the light will start to fade out (Fig15).


Fig15

Fig16



Fig17



COLOURED LIGHT FOR VOLUME

Lights can have colour - not all lights are “white”. The light from a light bulb is not actually white, but is actually slightly amber. The light from fluorescent tubes is a little green. You can use colour in lighting to achieve many things. You can at the very least use it to give volume to objects. Two opposing lights with opposing colours will give more volume to objects. The above image (Fig16) was rendered using two Area Lights. The one on the right has a bit of yellow with an RGB value of <242, 239, 210>. The Area Light on the left has a hint of blue, with an RGB value of <188, 224, 255>. When you use colours that are opposite each other in the colour wheel, you will give more dimension to your objects. In this case, the blue is barely noticeable, since the intensity is set to just 50%, whilst the yellow light on the left is set to 100% intensity (Fig16-17).


Fig18

COLOURED LIGHT FOR EMOTION

Coloured light can also help to evoke emotion, or meaning. The previous example uses colour in a very subtle way, where it is not really that noticeable. It mainly just gives volume to our model. However, colour in light can be more evident; you can “paint” a scene with light, and put emotion into it. The following image uses three different colours: green, yellow and blue. The background is completely black, and the tint of the atmosphere is created by a light that has volume in it. The model has a neutral grey surface. Light is therefore the only thing responsible for the colouring achieved in this render. Even the smoke that appears on the right is the result of a light parameter. We will cover such effects later on (Fig18).




Fig19a


Fig19b


Fig19c

INTENSITY FALLOFF

Light travels trough space without being blocked by particles. This doesn't happen in the Earth's atmosphere, where air particles and dust blocks light as it travels. Light starts to diminish with its intensity in such situations. This can be duplicated by using the Intensity Falloff setting, from the Light Properties. There are 4 options for us to use: Off, Linear, Inverse Distance and Inverse Distance^2. With Off, the light intensity will not diminish. All light rays will hit the surfaces with the same specified intensity. Linear sets the Falloff to a determined radius, set by the Range/Nominal Distance value. If set to 1 metre, the light will not reach beyond 1 metre, but the intensity will remain steady within that 1 metre radius. The Inverse Distance also makes use of the Range/Nominal Distance. This time however, light will start to fade after the Range/Nominal Distance has been specified. Inverse Distance^2 does the same, but light fades in its intensity much faster. The above image is an example of how such falloff settings affect our objects in different ways. The model on the left is being hit by an Area Light set to Linear falloff. Light is hitting the face and the legs with the same intensity. The image in the middle is being hit by the same light, but this time the falloff has been set to Inverse Distance. In this example, the face is being hit with more intensity than the legs. The model on the right has the same Area Light, however, this Area Light has been set to Inverse Distance^2. Notice how the light fades in its intensity from the face to the legs (Fig19a - c).

HOW DOES INTENSITY FALLOFF BEHAVE IN REAL LIFE LIGHTING?

Light from the sun travels through space without considerable falloff, therefore, in a space scene, you would consider turning the Intensity Falloff to Off. When light enters the Earth's atmosphere, the light intensity starts to diminish, therefore an exterior lighting setup may use an Inverse Distance falloff. Light in a room full of dust may be blocked quite fast, and therefore an Inverse Distance^2 value will fit the situation more. However, don't feel too constrained by these examples and rules. If you are looking for different results, try different uses for the same tools.

LIGHT PROPERTIES TABS

We can further manipulate how and what our lights illuminate by using the three tabs at the bottom of the Light Properties panel, which are the individual properties for each light.

THE BASIC TAB

There are four main options to trigger on/off in this tab: Affect Diffuse, Affect Specular, Affect OpenGL, and Affect Caustics. As previously

seen, the Diffuse value lets us know how much light is bounced back from a surface. Turning this option off will mean that the rays will not bounce back in order to make a surface visible. Affect Specular is our second check box option. Specular is a fake reflection, and if you are not using any specular values in your surfaces, it's better to turn it off. Affect OpenGL determines if the light will be previewed at your viewports. Affect Caustics determines if the light will illuminate other objects indirectly when it is bent and bounced by refractive materials, such as with crystal (Fig20).

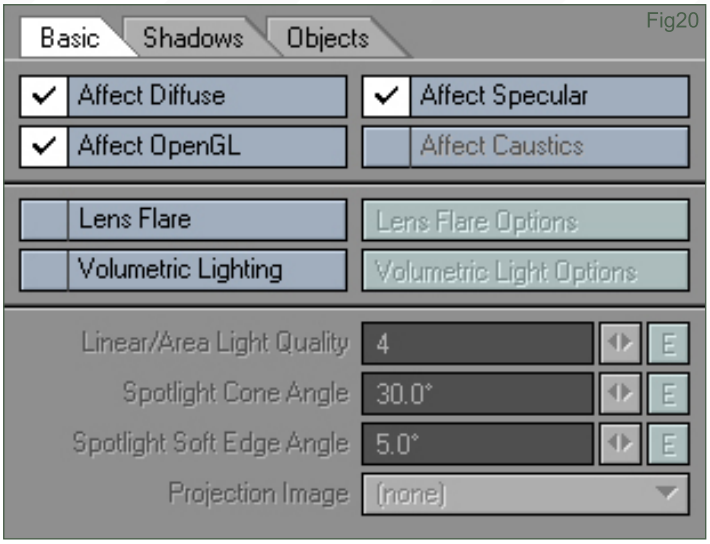


Fig20

DIFFUSE

If we turn the Diffuse value on, then the intensity of the light will be shown, making changes in the shading of our plane. The following render (Fig21) shows a scene in which a Distant Light has its diffuse value activated. Shadows are shown, but Specular values are not, since we haven't activated that option yet (Fig21).


Fig21

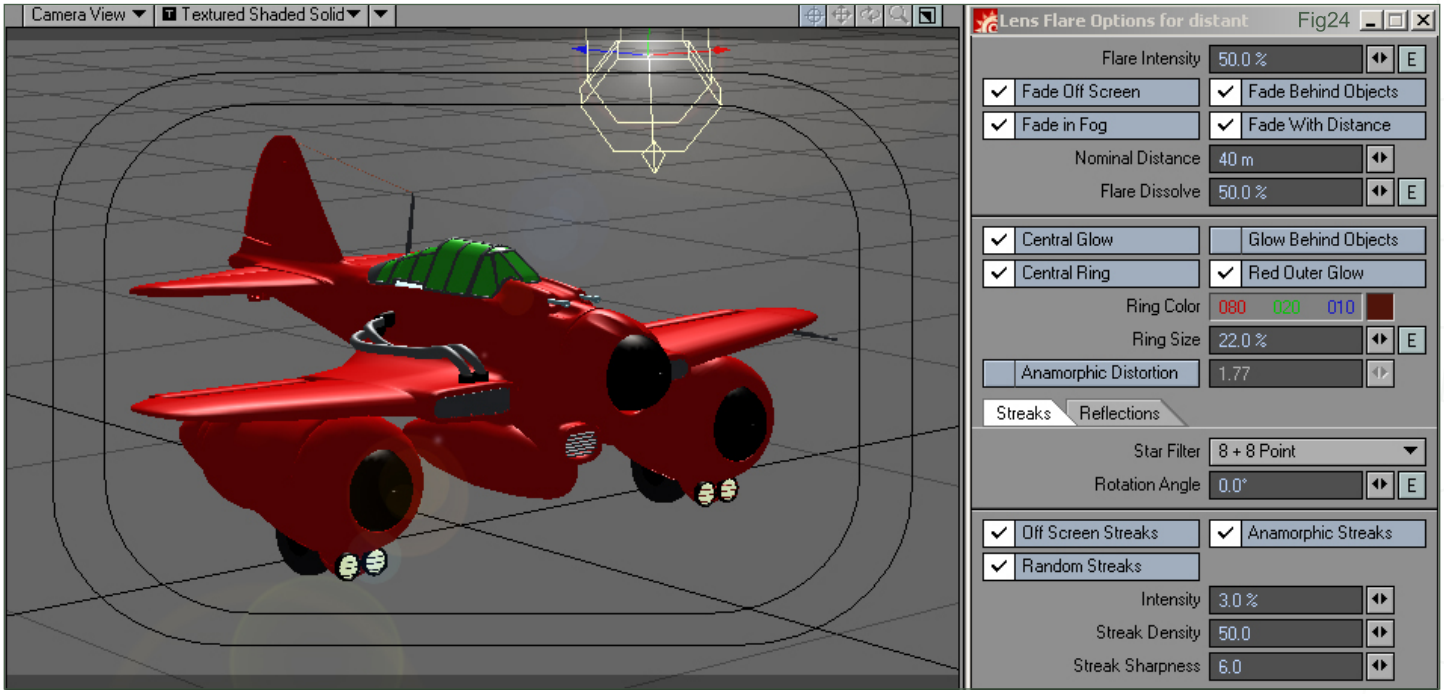
SPECULAR

When the Specular value of a light is activated, the light will be able to affect surfaces with specularity on them. This change is especially noticeable on the grey areas of the following plane render (Fig22). They now shine and show a white spot, referred as a "hot spot". Specularity is a fake reflection, such as the square painted on the drawing of an apple. However, it allows you to give that required spark for metals. More realistic "hot spot" methods will be discussed in later chapters (Fig22).


Fig22

Fig23





Lens Flare

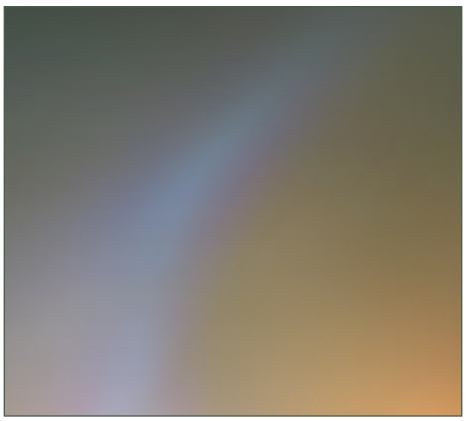
We can also activate Lens Flares, which are glows that happen when light hits directly upon our camera lens. This effect is commonly avoided by real life photographers. Therefore it is not activated by default in LightWave lights. You can however activate it by clicking on the Lens Flare check-box. You can further tweak the streaks, reflections, glow, intensity, fade, ring colour and many other parameters of Lens Flares by using the Lens Flare Options. The following images (Fig23 - 24) show the same Distant Light, which is now facing the camera.

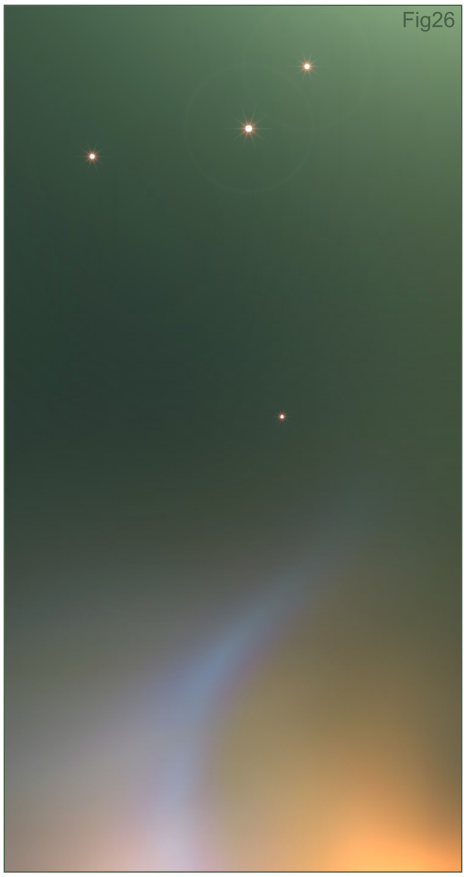

Fig25

VOLUMETRIC LIGHTING

Volumetric Lights can show fog inside their light paths. You could argue that all lights should be volumetric, since real life lights are always blocked by floating particles. Volumetric Lights take more time to render, and therefore they are normally used only when necessary. Just like the Lens Flares, Volumetric Lights can be further tweaked by clicking on the Volumetric Light Options button. You can add projections, noise, turbulence, movement, and many other things (Fig25). The dust and light effects, created by Volumetric Lights, can be taken to really high levels. You can also add textures to Volumetric Lights. In doing so, you can manipulate how the dust looks inside the beams of light. With the addition of Lens Flares, you can use lights alone to create interesting space scenes. Because Volumetric Lights actually have volume, you can actually create space animations (Fig26).






Fig26






LIGHT QUALITY

The last part of the Basic tab gathers more specific information regarding our light. Linear/ Area Light Quality determines the quality of our light. The higher the quality, the better shadows you will get, but the longer it will take to render. The following image shows a lighting setup with Area Lights set to different quality levels. The far-left image has a light quality of 1. Noise in this image is very evident. The next image shows less noise, since the light quality was set to 2. The middle image has the light quality set to 3. Noise is barely visible in this one. The fourth image from left to right has a light quality of 4, and noise is no longer present. The far-right image has a light quality of 5. This image has the smoothest surfaces, but took the most time to render. By experience, light quality is respectable at 3, recommended at 4, and if your render times can afford it, should be set to 5 (Fig27).

SPOT LIGHT ANGLES

Spot Light Cone Angles will be activated if our Light Type is set to Spot Light. It sets the angle of aperture of the light. The Spot Light Soft Edge Angle determines the fall-off that Spot Lights will have around its circumference. The higher the value, the smoother the edge of the Spot Lights. The following image shows 3 different configurations for a Spot Light. The left-most image has a Spot Light Cone Angle of 30°, and also a Spot Light Soft Edge Angle of 30°. The Angle of the Spot Light is able to cover up most of the face of the model. The soft edge is also giving some good "fuzziness" to the way that the Spot Light is behaving. However, the Spot Lights at the centre and right of the image are different. They both have a Spot Light Cone Angle of 5°. The main difference between them, is that the Spot Light at the centre has 0° as Spot Light Soft Edge Angle. This creates a sharp edge around the Spot Light. The image at the right has a Spot Light Soft Edge Angle of 5°, which creates a soft edge that the middle image does not have. LightWave allows you to specify Spot Light Soft Edge Angles that are equal, or lower to, the Spot Light Cone Angle (Fig28).


Fig27


Fig28

THE SHADOWS TAB

There are two types of shadows inside LightWave: Shadow Map shadows, and Ray Traced shadows. Shadow Maps work only with Spot Lights, and are fast to render. They are however "fake" shadows. Their form and quality relies mainly on the Shadow Map Size and Shadow Fuzziness. They are not a good option when you try to attain impressive lighting and realism. Ray Traced shadows are more precise. They do take more time to render, but are far superior in quality. The following image shows a Spot Light using a default Shadow Map Size of 512, with a Fuzziness of 1 (Fig29). The shadows produced are not as sharp as they should be, and have a "pixelated" edge. This could be corrected by adding a higher Shadow Map Size (Fig30). The following image was rendered with the same Spot Light. However, Raytraced shadows were used instead this time. The resulting shadows are more accurate and have no artifacts at their edges (Fig31). **Note:** There are numerous techniques to achieve acceptable levels of quality using Spot Lights. The most common technique is named after its nature: "spinning light trick". Its inventor is Dave Jerrard, and you can currently find it on the Internet by Google-searching "spinning light trick".

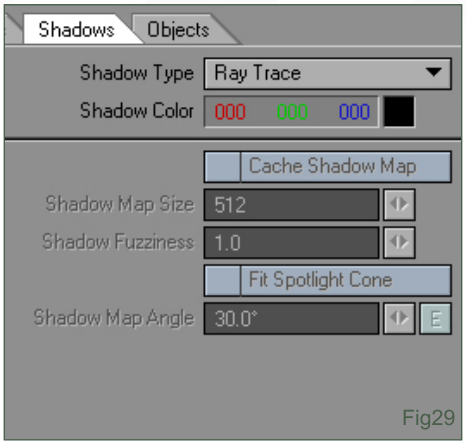


Fig29

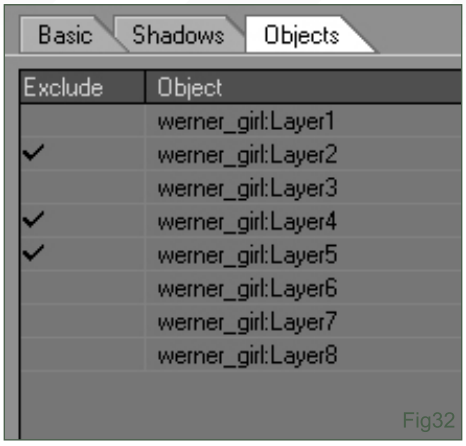


Fig32


Fig30

THE OBJECTS TAB

This tab allows you to exclude the influence of a light over specific objects. A real-life light will affect all of its surroundings. Lights in CG can affect all, or just part, of the elements inside a scene. This is of incredible value, both for stylised lighting setups and/or realistic lighting rigs. For instance, you can make a light affect just the specular value of just one metal object inside your scene. You can also fake radiosity by using lights to recreate light bounces that will affect specific objects. This essentially gives you more control over what is illuminated, allowing you to create richer visual results with reduced rendering times (Fig32).


Fig31

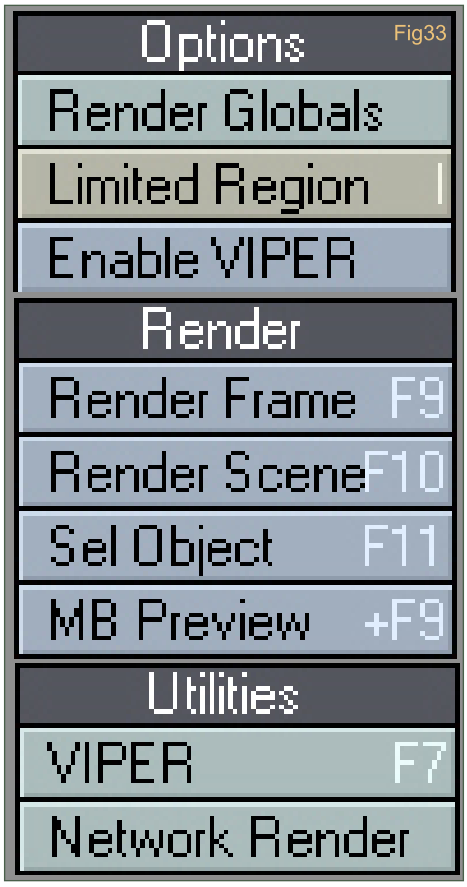
The Render Tab

The Render Tab inside Layout includes several functions. The most important one is the Options: Render Globals. This button activates a pop-up window where most of the rendering settings are included. Enable VIPER activates the VIPER preview system (which I personally don't recommend). Render Frame (<F9>) renders the frame at which the time head is positioned. Render Scene (<F10>) renders the entire sequence/animation. Sel Object (<F11>) will render the selected object. MB Preview will preview Motion Blur. Other included buttons are VIPER (<F7>) and Network Render, which you would use in order to render along a render-farm (Fig33).

Render Globals

Using the Render Globals pop-up is enough to begin with. It has different sections. The first options specify the render domain. The Range Type drop-down menu is set by default to Single. It can also be set to Arbitrary or Keyframe. The field labelled as "First" will specify the first frame of a sequence to be rendered. The Last field specifies the last frame to render of a sequence. By default, the Step value is set to 1. This value specifies if the sequence should be rendered continuously, or if frames should be skipped. For example, if you want to render the 1st, 5th and 10th frame of a sequence, then you should specify a Step of 5. Activating the Auto Frame Advance check-box will allow sequences to rendered continuously without any pause between frames. Frame End Beep will activate a "beep" sound each time a render is finished (Fig34).

Fig33



Preview

The Preview option can be turned off when you know that the rendered outcome will be correct. Otherwise, it allows you to specify a preview size that will be shown whilst the render is being processed. You can select Off, 320x240 and 640x480. In case something is starting to look odd, you can stop the render by pressing the Abort button, or the <ESC> key (Fig35).

Render Status

The following image shows the Render Status window. This window appears after you start rendering a frame or sequence. It shows the main parameters of the render. The image previewer will be shown here if activated (Fig36).

Render Display

This option specifies in which type of window the

Fig34

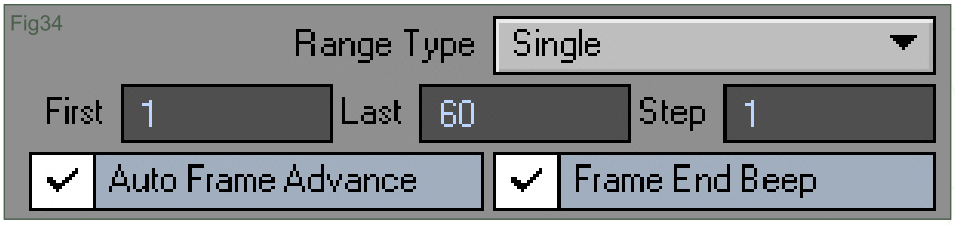


Fig35



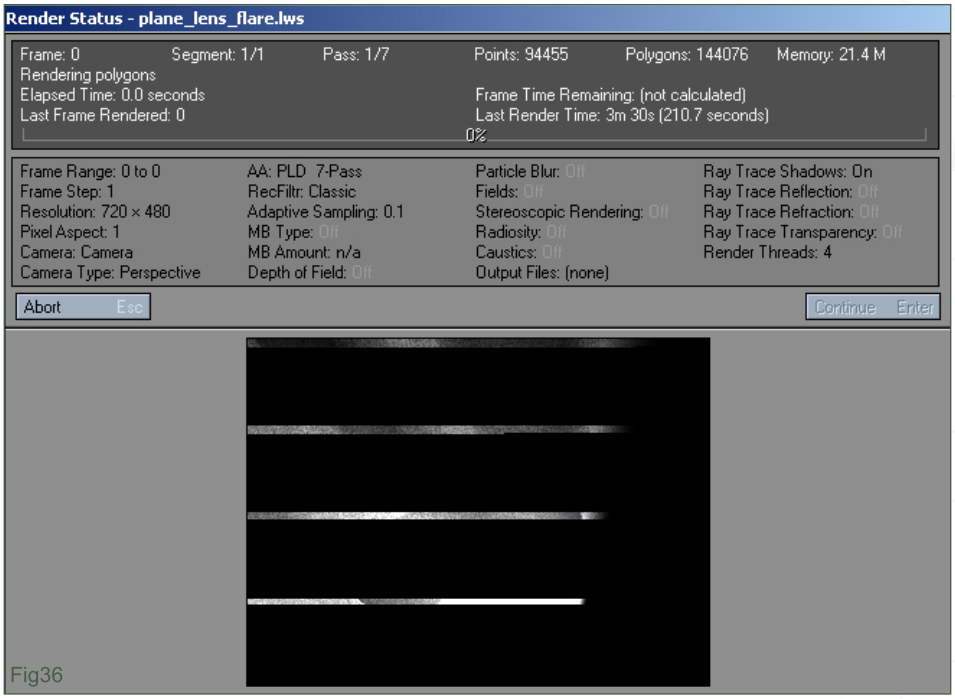


Fig36

finalised render will appear. There are several ways to show a finalised render. The default option is Image Viewer.

Render Details

The next section includes information regarding the Height and Width of our renders. There are some pre-defined settings that can be selected from the Resolution drop-down menu. The Multiplier drop-down will allow you to set the size percentage of a render. This option is useful when you are doing render tests. It allows you to test scenes by producing smaller renders, but keeping the same image proportion. You can also set the pixel Aspect ratio and the Frame value in this section (Fig37). You can set the Field Rendering to Odd, or Even. This option should be taken into account when you are rendering for television. I would recommend rendering frames with this option set to Off, and then later on export the animation via a post-processing program. Programs such as After Effects and Premiere (there are many others out there) can take the original render with no Field Rendering, and export it with a Field Rendering set to Even or Odd. This is not because LightWave will do a bad job, but is more about giving you the ability to decide that later on, without re-rendering your sequence, if you realised you made a mistake in this option (Fig38a - b).

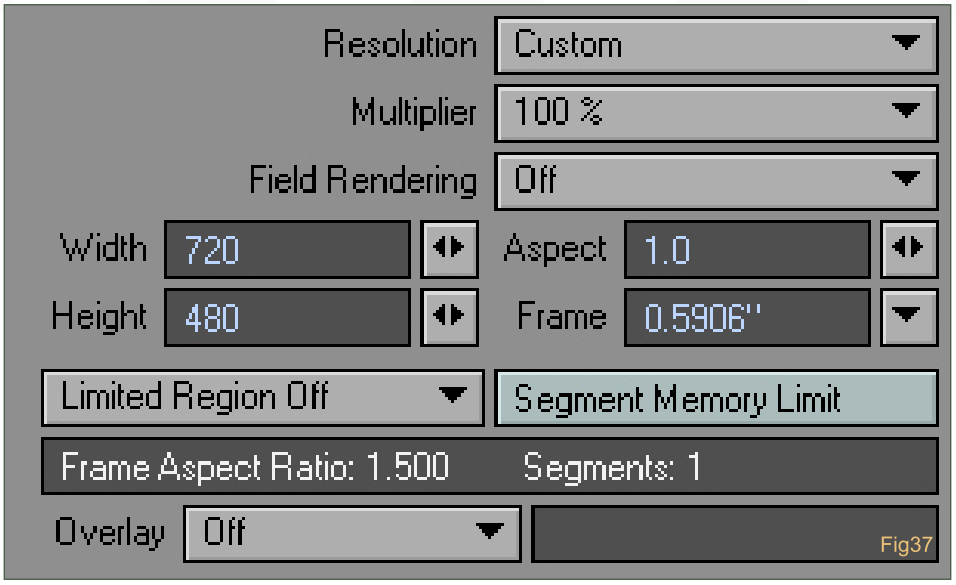


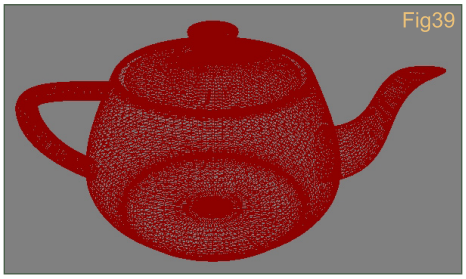
Fig37



Fig38a



Fig38b


Fig39

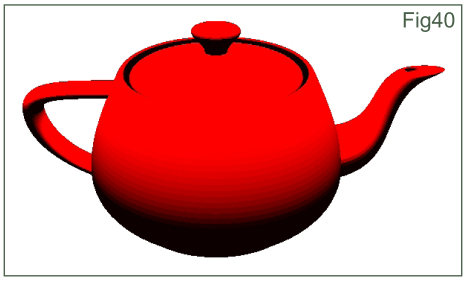
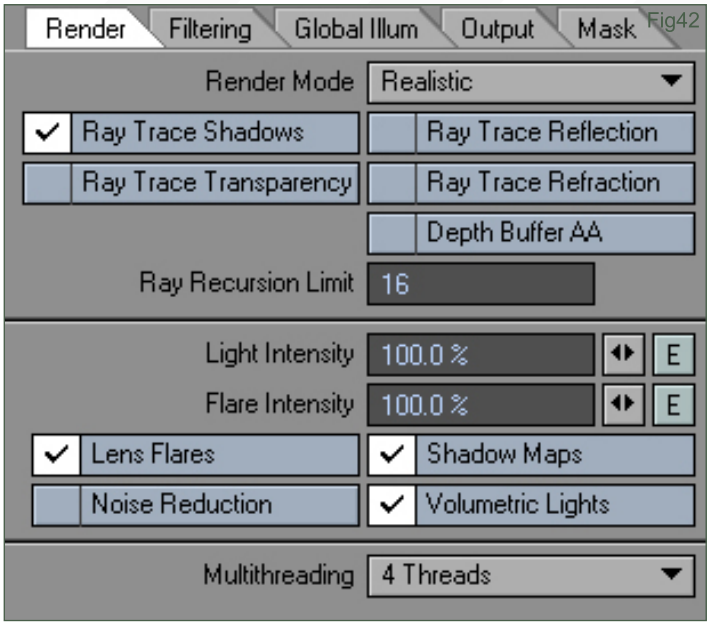
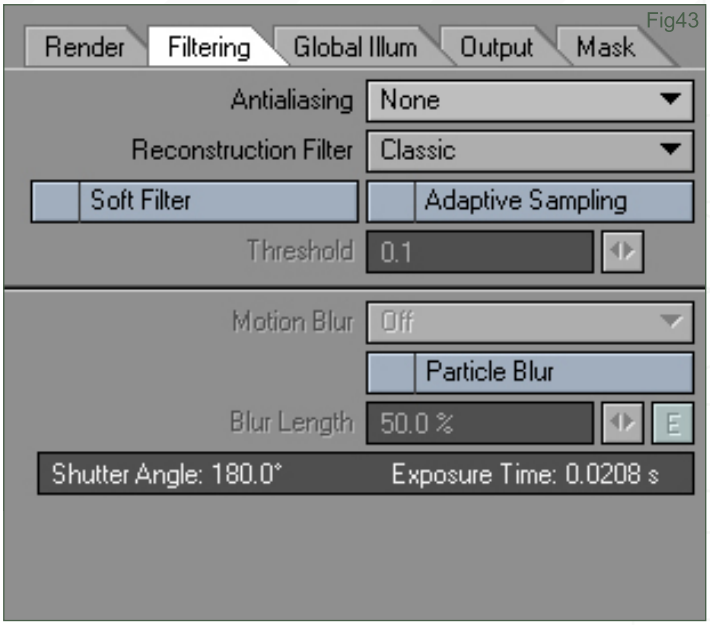

Fig40


Fig41

Render Tab

This section contains very important options that are commonly over seen by beginners. The Render Mode drop-down menu controls the style of the rendering. You can Render a Wireframe, a Quickshade or a Realistic rendering. Let's further explain this, since it may be a cause of confusion. The Wireframe mode will render the wireframe without the polygons. It's not an option to render the so-called "clay-render". Quickshade will make a draft render with basic surfacing properties. It is mostly used by animators who want to preview an animation. The Realistic option will not make renders look realistic by default - no, it is not a magic button. However, it will allow the activation of the Ray Trace Options underneath, which are necessary to produce realism. See Fig39 for the Wireframe render, Fig40 for the Quickshade render, and Fig41 for the Realistic render.





RAY TRACING

"Ray Tracing is a general technique from geometrical optics of modelling the path taken by light, by following rays of light as they interact with optical surfaces. It is used in the design of optical systems, such as camera lenses, microscopes, telescopes and binoculars. The term is also applied to a specific rendering algorithmic approach in 3D computer graphics, where mathematically-modelled visualisations of programmed scenes are produced using a technique which follows rays from the eye outwards, rather than originating at the light sources. It produces results similar to ray casting and scanline rendering, but facilitates more advanced optical effects, such as accurate simulations of reflection and refraction, and is still efficient enough to frequently be of practical use when such high quality output is sought."
- http://en.wikipedia.org/wiki/Raytracing

RAY TRACE OPTIONS

By default, the Ray Trace options are not activated in Layout. So, even if you add a light that has ray traced shadows on, they will not show if the main Ray Trace Shadow check box is not activated. The same thing will happen with the rest of the Ray Trace options, such as Transparency, Reflection and Refraction. It is advisable to activate these options at the beginning of your lighting setup. Underneath these options you can find the Depth Buffer, AA. It's advisable to activate this option when dealing with DOF and Motion Blur (Fig42).

RAY RECURSION LIMIT

This takes major importance when dealing with transparent and refractive objects. It allows the renderer to know how many times a ray should go trough transparent objects. In real life, light goes in and out of transparent objects an infinite number of times. This makes objects, such as glass, have a specific look. In 3D we have to limit that amount so that our render times don't go too high. The default works great, but if you are encountering render time problems with transparent objects, then try lowering this number and see if the render quality is still acceptable. If you set it to 0, you'll just see the backdrop colour of your scene (which is black by default).

LIGHT INTENSITY

This is a multiplier for the Light Intensity of all lights of your scene. It sometimes happens that you do a lighting setup that at the end needs a little more intensity overall. So, instead of tweaking all the lights, you can increase this value a little.

FLARE INTENSITY

This is similar to the Light Intensity, but it controls the Flare Intensity of all the lights that have Lens Flares activated. The next section includes other check-boxes to activate or de-activate options such as Lens Flares, Shadow Maps (from Spot Lights), Volumetric Lights and Noise Reduction. They are all global properties that will allow you to turn the values of all the lights inside your scene on/off, so you don't have to do this individually.

MULTI THREADING

In the old days, machines processed everything via one thread. Nowadays, machines can process information via many threads. When you install LightWave on your machine, it will, by default, configure an optimal value here. Feel free to make changes and see if you get faster rendering results though. The more processors you have, the more threads your machine is likely to be able to handle.

FILTERING TAB

One basic feature here is the Antialiasing drop-down. If you don't antialiase your renders, they will come out with pixelated borders, looking quite cheap and amateurish. But, how much should you put? Again, it depends on how much you want to wait for the render to come

out. However, a PLD 7-Pass works good to get started. PDL 21-Pass is as much as I have used. But of course, LightWave allows much higher values for those who can afford the render times, but desire extreme quality (Fig43). See Fig44 for an image without antialias, and see Fig45 for the PLD 7-Pass.

What is Global Illumination?

Lighting in 3D is calculated by algorithms. Global Illumination is the 3D lighting that takes into account both Direct and Indirect Lighting. Images rendered using GI often appear to look more photo-realistic. However, Global Illumination takes a long time to calculate. The following two images show the difference of an image rendered with GI (Global Illumination), and one without it. The render without GI shows a darker surface and darker shadows. Only Direct Lighting is taken into account. This makes the render look odd, and with too much contrast. The image with GI shows better looking surfaces and shadows. The surface is more evenly lit by our light. In this second image, indirect bounces are taken into account. This softens the shadows under the teapot and the shading of the surfaces. Notice the spillage of red colour over the white ground. Render without Global Illumination can be seen in Fig46, whilst the Render with Global Illumination can be seen in Fig47.


Fig44


Fig45


Fig46


Fig47

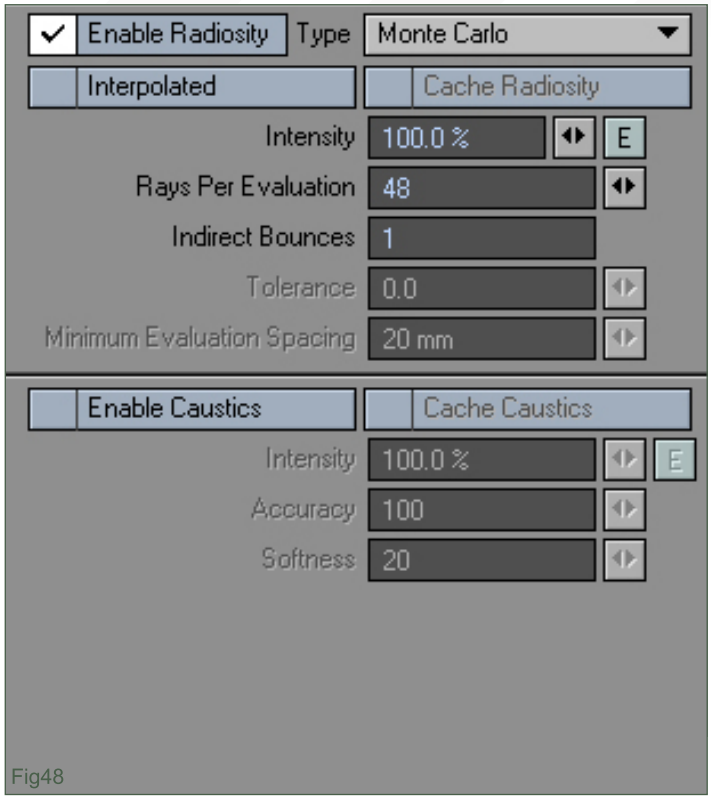


Fig48

Global Illumination Tab

The following image shows the tab inside the Render Globals menu. This tab holds the Global Illumination properties for LightWave. The top part gathers information regarding the type of radiosity algorithm to use, and the parameters to tweak it (Fig48).

What is Radiosity?

It is a Global Illumination algorithm used for rendering. There are different types of radiosity; LightWave includes several types for you to use. They can be selected via the Global Illumination Tab inside the Render Globals panel. There is Montecarlo and Backdrop radiosity. LightWave 9.2 introduced Final Gather. You can vary the Intensity to which each one is calculated. 100% is the default value; having values over 100% would bounce more light that the one that is received. Some people use higher values in order to attain soft effects for the rendering of organic scenes. Nowadays this is not necessary, since the new nodal system includes accurate shaders that can produce organic surfaces without the need of such tricks. Rays Per Evaluation will determine how precise the calculation is. The more rays used, the more precise it will be, but the longer it will take to render. Futhermore, you can vary the Indirect Bounces that will be

Fig49




Fig50

calculated. Before LightWave 9.2, increasing this value by 1 drastically increased the render times. It is now possible to have acceptable render times even with this number going up. The more bounces you put in, the more light will bounced inside your scene, but the longer it wil ltake to render.

When Should I Use Radiosity?

Radiosity helps us create more realistic images. LightWave's radiosity algorithms can get you great results, but do take longer to render. However, LightWave 9.2 brought us great rendering speed improvements. It is now easier to render complete animations using radiosity in a single machine. Fig49 is a clear example of Global Illumination. Light from outside the window enters the room, and illuminates everything inside it. There is no Direct Lighting hitting the roof, lamps, or anything besides the carpet.

Caustics

This next part is dedicated to Caustics, which are indirect hot-spots caused when rays of light are reflected or refracted by a curved surface, projecting rays onto another surface (Fig50). Such a principle is put to practice when a magnifying glass is used to produce heat, and on a sunny day, moving caustics can be seen at the bottom of a pool.

Third Party GI Solutions

There are several third-party plug-ins that allow faster GI solutions. Worley's Fprime www.worley.com and Kray www.kraytracing.com are two wonderful examples.

Conclusion

This chapter has covered some main lighting concepts, and several lighting tools used inside Layout. It is important to understand what each tool was made for, so that you can identify when to use it. Furthermore, if you want to break the rules, you first need to know what those rules are! There are more tools and concepts to be learned in the following chapters. Balance is the clue for lighting. Therefore, we will start to combine the previously explained into a more coherent and productive work-flow. In doing so, I hope to demystify part of the art of lighting...

Cesar Alejandro Montero Orozco

For more from this artist visit:
http://www.archeidos.com
Or contact montero@archeidos.com

Credits:
The plane model was created by Christophe Desse. The girl model was created by Werner Ziemerink. The Kitchen Model was created by Evermotion.



"Ghost Rider" images courtesy of Columbia Pictures.
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5 O'Clock

This is the first 3D Making Of that Gustavo Sandrini Groppo has created. In this "Making Of" he shows you, step-by-step, the process that he used when creating "5 O'Clock"...

"In this scene created from scratch, I tried to achieve a photoreal quality of work"



5 O'Clock

Created In:

Chaos Group Vray 1.5, Photoshop

Introduction

This is my very first Making Of in four years working with 3D graphics, and it is a pleasure to share my work process here, with you. I graduated in Digital Design from São Paulo, Brazil, but my passion is computer graphics. In this Making Of, I'll try to give you an objective explanation of my work titled, "5 O'Clock".
So, here we go...

Inspiration

As an attentive taster of English teas, together with my passion of product visualisation and appreciation of the English culture, I decided to build this typical English tea-time. In this scenery made from scratch I tried to achieve a photoreal quality work.

Sketching

Before I start the modelling process I usually make a fast sketch, with primitives, to test the composition, lighting and some render setups. I think this is very interesting because since the beginning I had a brief idea about how the final image would look. This sketch was not a complex work; just boxes, cylinders and planes shaped to the objects that I had in mind. The lighting sketch was just to test how the shadows would behave, to define it's direction and the mood I wanted to achieve. For accurate setups like GI and image based lighting with HDR maps I work just on the final lighting.

The Modelling Process

The modelling work began here. It was time to get lots of references of cups, jars, breakfast stuff, tea stuff, and other kitchen objects. To

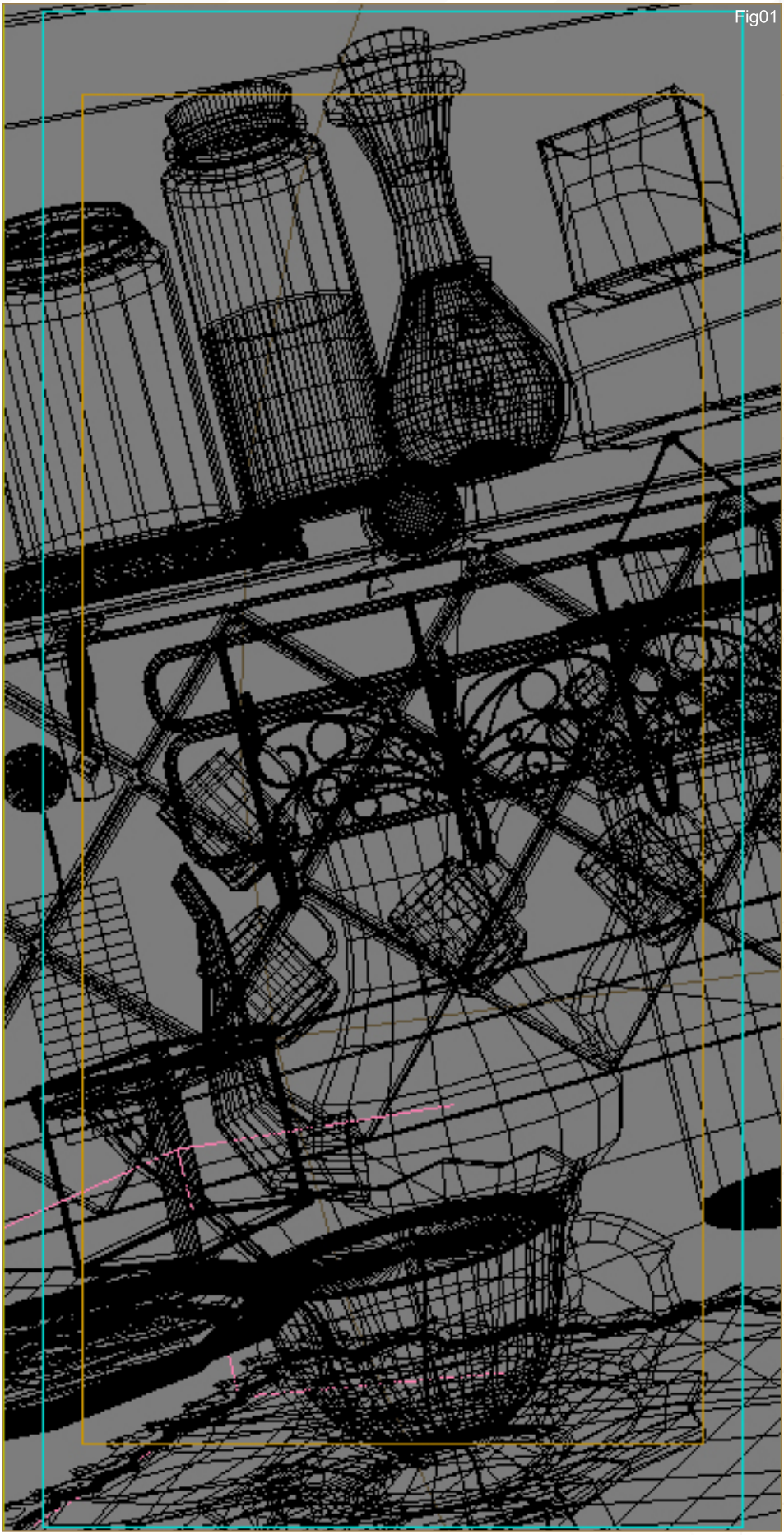
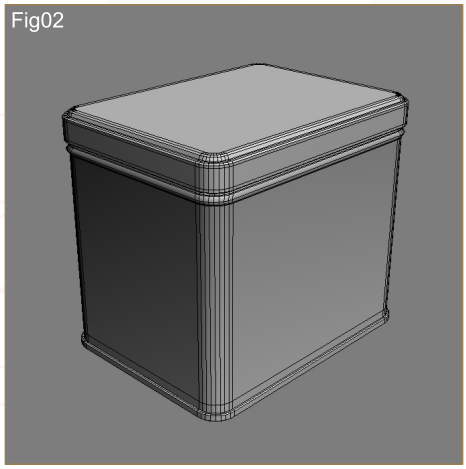

Fig01

Fig02



create the objects I just used polygon modelling on primitives, like box and cylinder, modified with bevel, extrude, cut, chamfer, lathe, etc. I consider this modelling work to be basic, but the union of many objects will give the work a complex look. For some objects I used photo references which I took from the Internet, such as tea boxes, coffee and honey bottles. All of the others I created myself. One very important thing that 3D modellers, mostly beginners, have to keep in mind when working with many objects in a scene, to avoid the slowing down of computer memory, is to smooth the objects just in the render iterations, then they will have a low poly count to work on and the processes will be fast. Some objects I prefer to model outside the scene and then merge them, or use an XREF, to link it. Fig01 shows the wireframe of the scene overview. The tea tin can be seen in Fig02, shelf support in Fig03, coffee cups in Fig04, tea cup in Fig05, sugar pack in Fig06, coffee jar in Fig07, and the flag can be seen in Fig08.

Fig03

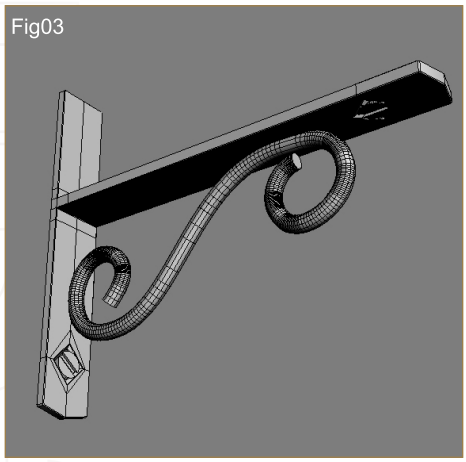


Fig04

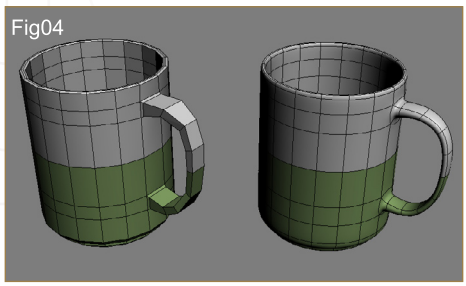
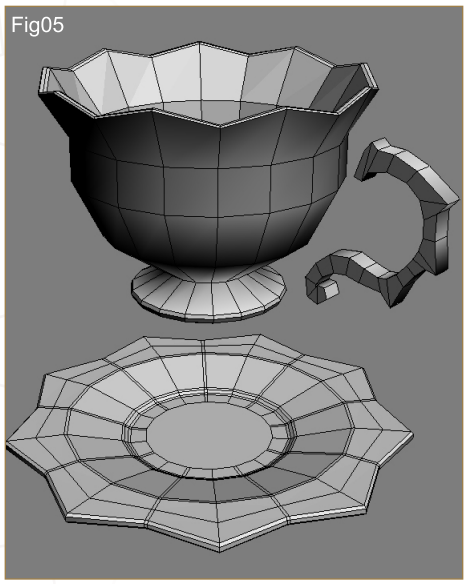
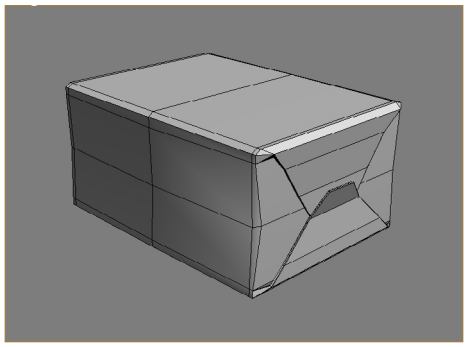
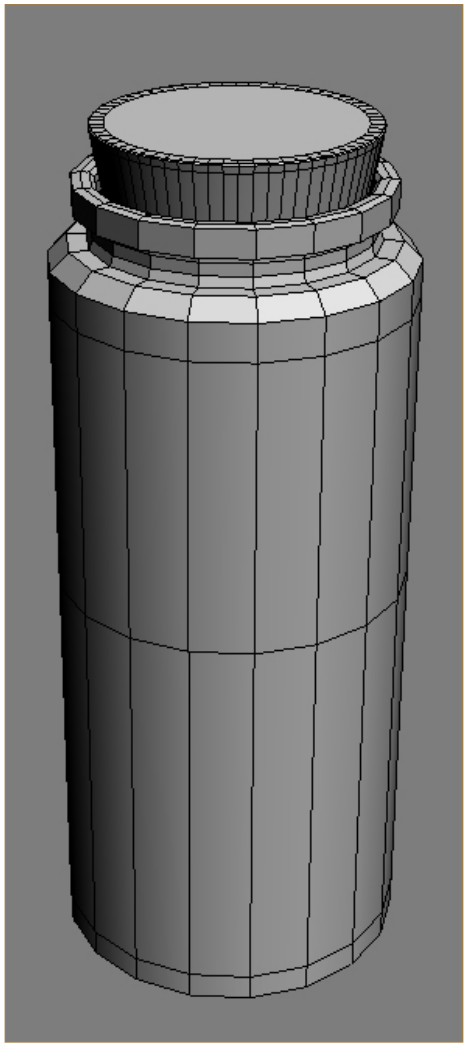


Fig05







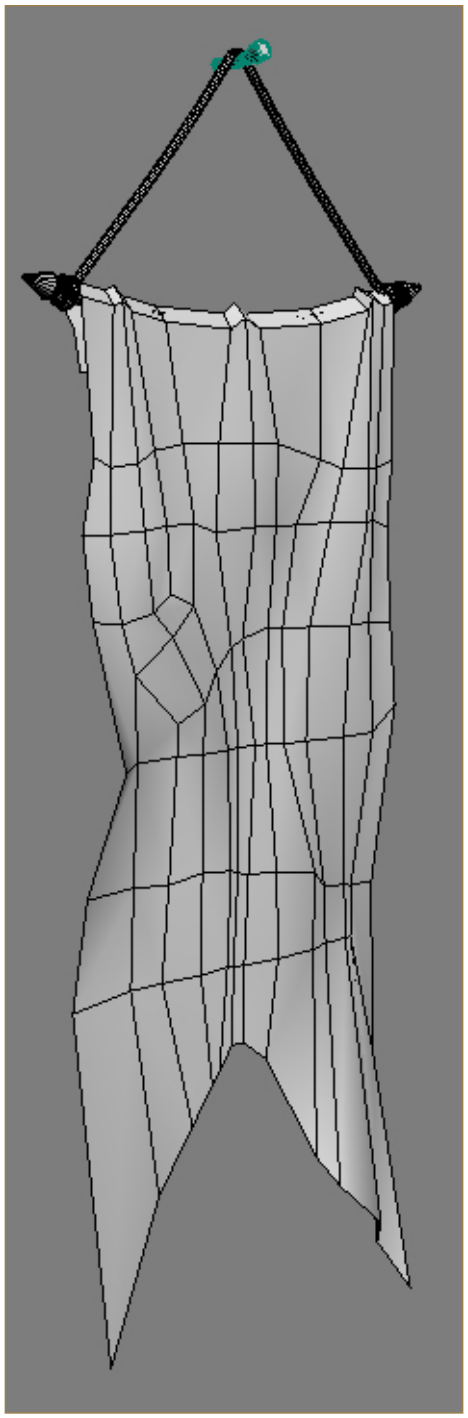



Fig09

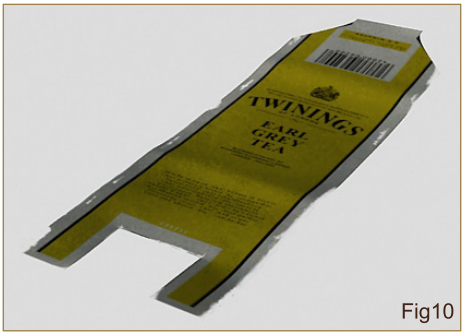


Fig10


Fig11

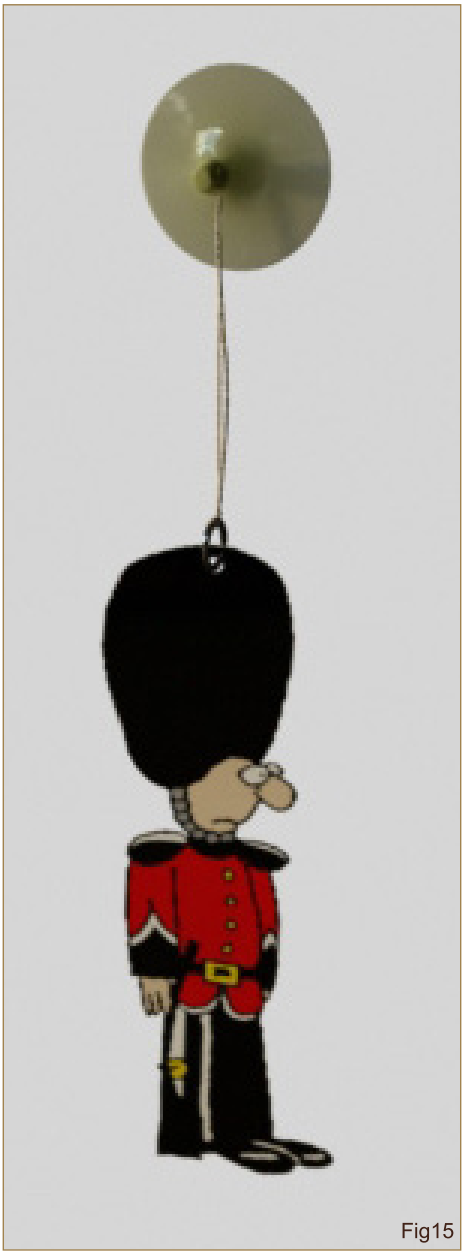


Fig12


Fig14



Fig13


Fig15

Textures

To texture the objects I usually unwrap all the meshes, and when I don't feel the need to do that I apply a simple UVW modifier to the objects. Most of the textures were taken as photographs. Some maps such as "Twinings" and "Ahmad" tea I needed to paint in Photoshop. The logos were taken from www.brandsoftheworld.com. All the maps vary between 2500 and 4000 pixels, depending upon the details and how much they will appear in the scene. As I use Vray for rendering, all the shaders are Vray 1.5 power shaders. There are no standard materials in this scene. Texture map samples can be seen in Fig09. Some close-ups of the textures on objects in different views can be seen in the following images; tea bag pack (Fig10), sugar pack (Fig11), tea box (Fig12), tea bag string (Fig13), tea cup (Fig14), Buckingham guard (Fig15). The shader samples can be seen in Fig16.

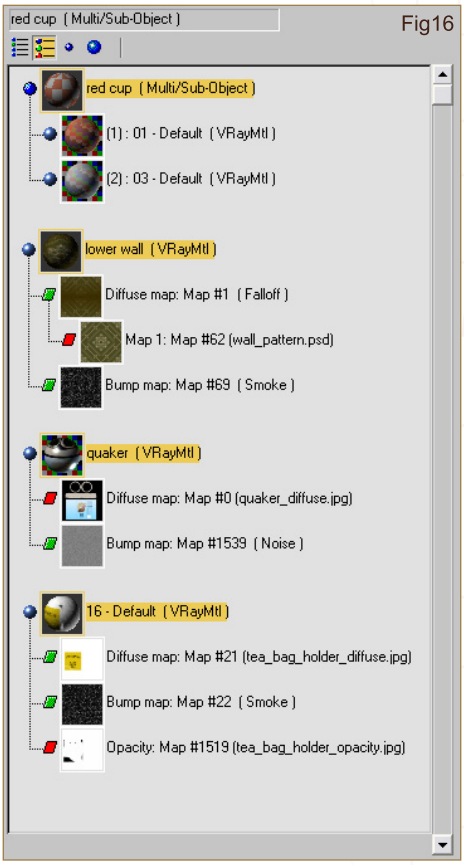


Fig16

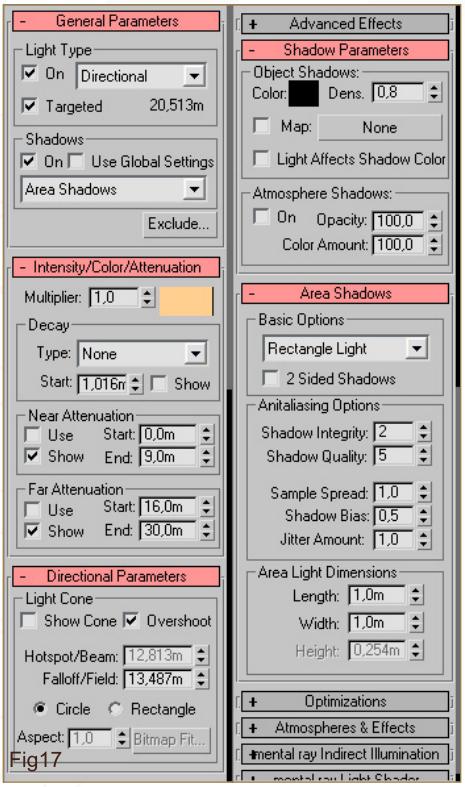
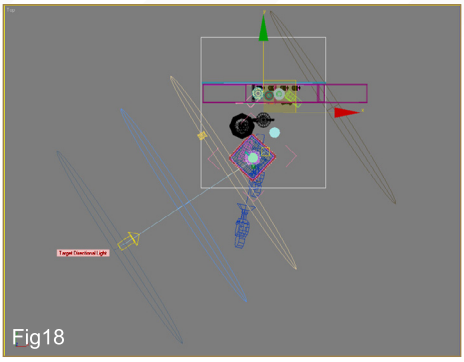


Fig17


Fig18

LIGHTING

The lighting that I created for this work consists in one HDR map for the environment, to control the "5 O'Clock" mood, and one direct target to simulate a few sunlight rays entering the ambient setting. Together I set up the Vray GI engine. The light position can be seen in Fig17, the light setup Fig18, Vray lighting + GI pass in Fig19, and the GI pass in Fig20.


Fig19


Fig20

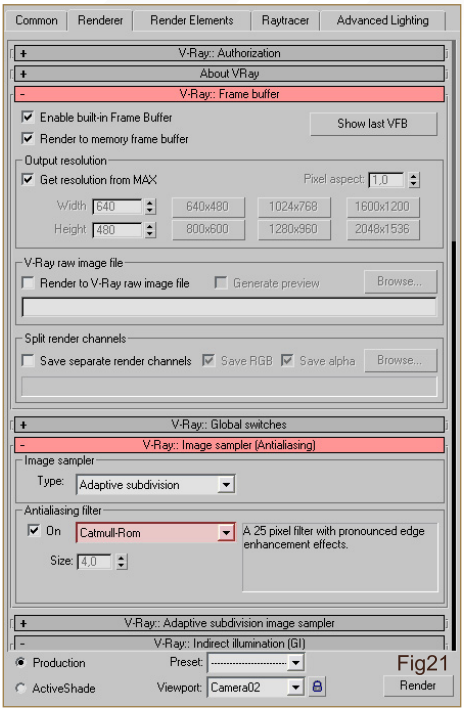


Fig21

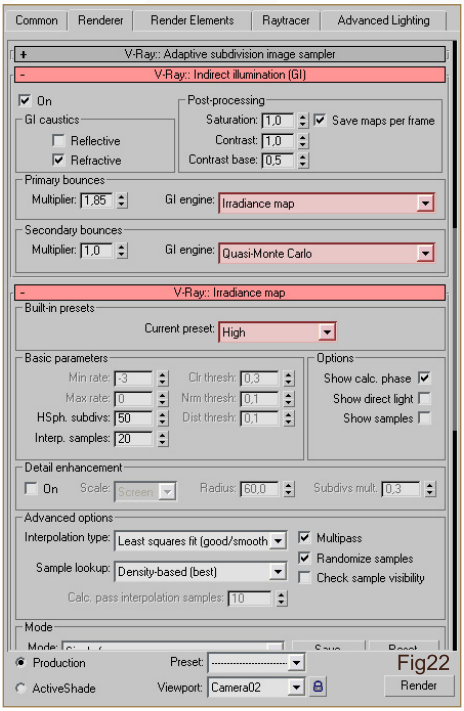


Fig22

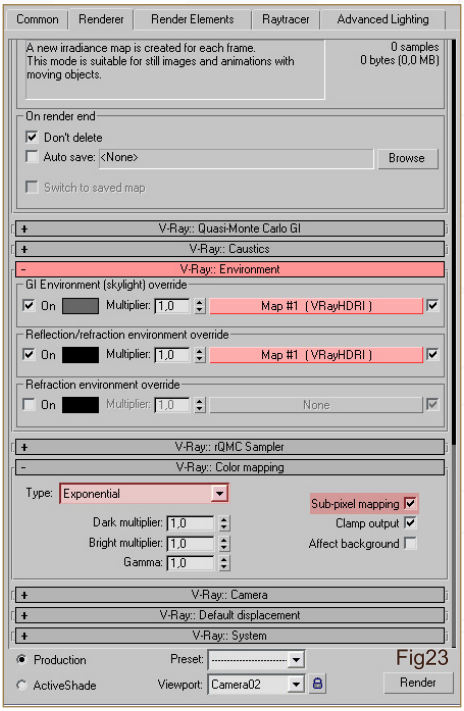


Fig23



Fig24a

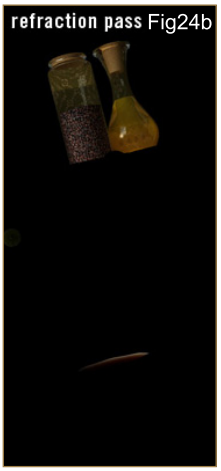


Fig24b

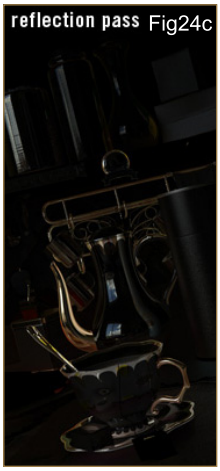


Fig24c



Fig24d

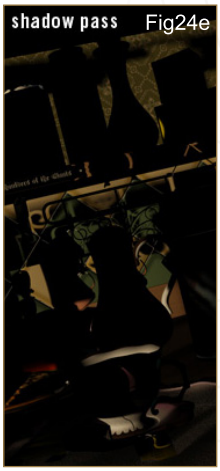


Fig24e



Render

This is the cool bit in my opinion, it is the time that you get to see the result of all of the processes and the time that the 3D meshes come to life. To render I used Chaos Group Vray 1.5, which has a wonderful GI engine and allows users to reach maximum realism. I rendered this scene in passes, such as diffuse, GI, shadows, reflections and refractions, in Vray elements. I then put it all together in Photoshop. The render setup can be seen in Fig21 - 23. Passes can be seen in Fig24a - e.



Fig25



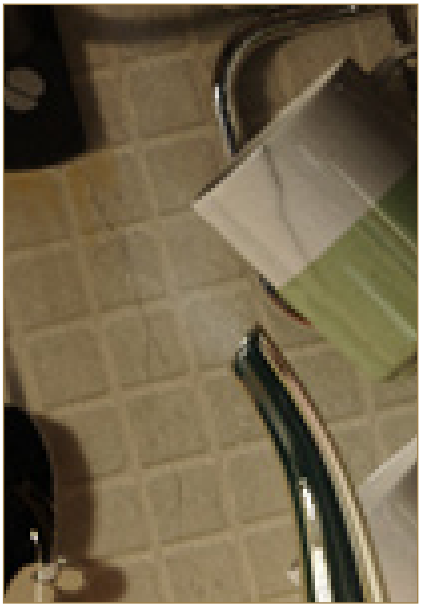
Fig26

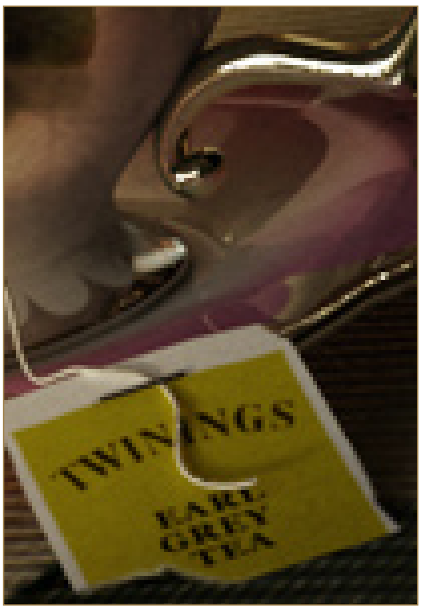
Post-production

In Photoshop I made some colour corrections, tweaked the levels and added some details, like cracks in the jar, and gave the image some dirt and noise to kick off the CG look, and generally tried to give the image a natural, and old, effect. Post-production work can be seen in Fig25 - 26.









Gustavo Sandrini Groppo

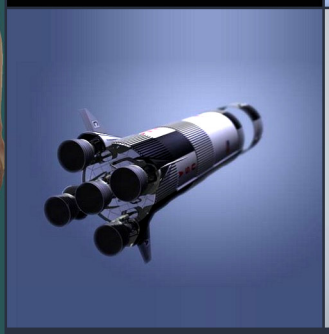
For more from this artist, please contact:

gugroppo@gmail.com or visit

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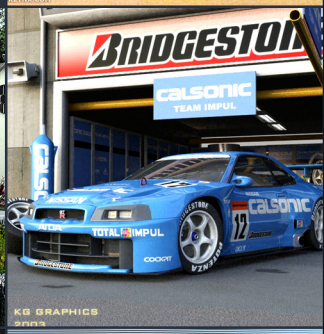



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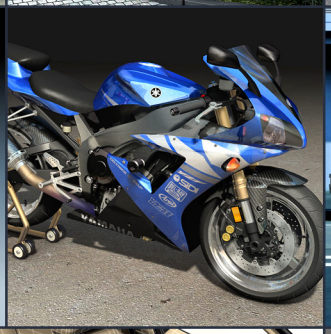
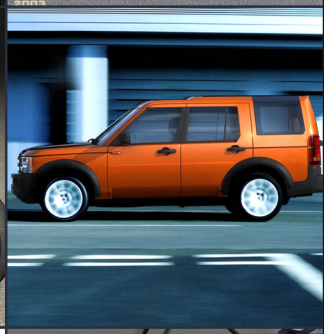
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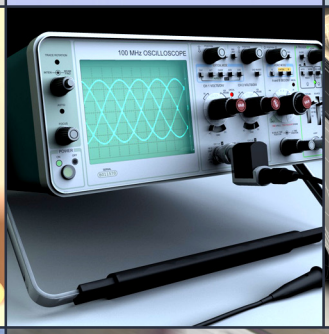




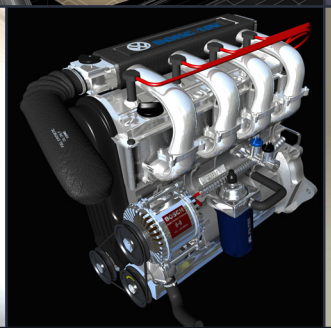










Modelling

by Kevin Beckers a.k.a. Tycane

"Not a lot of fancy tricks here, just clean, old, simple modelling..."

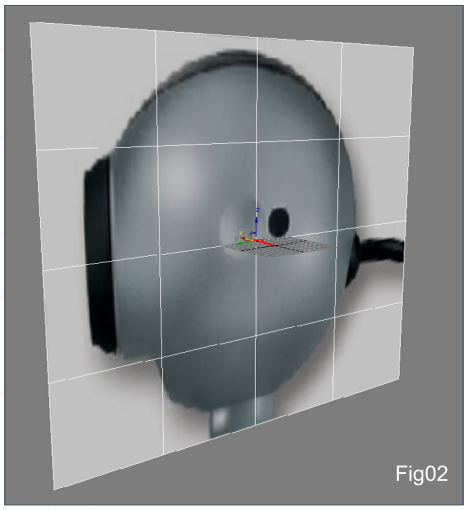
After being inspired by Rodin's "Thinker", and needing to improve his Mental Ray skills, Kevin created this image. Here's how he did it...

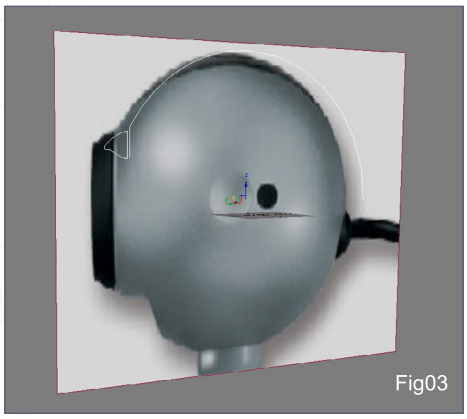


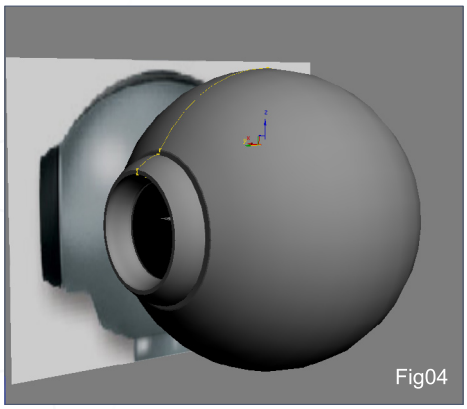
'ITS FOR YOU'

Created In:

3D Studio Max, Mental Ray


Fig02


Fig03


Fig04

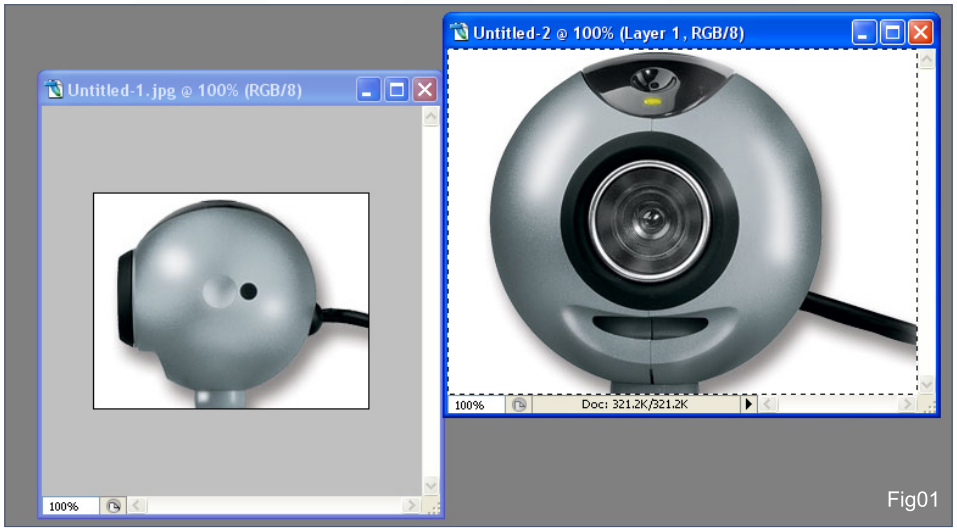


Fig01

The Character

For this Making Of, an intermediate knowledge of 3D Studio Max and Mental Ray is required. I started work on this image after seeing a small photograph in a TV guide of Rodin's "Thinker", where the head had been replaced by a Logitech Quickcam, and I thought it would make a cool character.

I started out with the character, by finding a side and front profile of the Quickcam on Logitech's website (Fig01), and took those into Max. I then made a plane the same size as the image and made a standard material with the image, to set to the diffuse slot, and applied that to the plane for reference, and then placed the plane a little behind the centre line in the viewports grid. That way, all the lines and geometry that you draw, using the side viewport, appear in front of the image, so that you can see what you're doing (Fig02). By right-clicking on the plane, and going into the properties, I froze the plane and de-activated, shown frozen in grey. That way the plane would stay in position at all times. I never use Max's image background (Ctrl-B) as reference, because I've had the image shift out of place, lock zoom, and pan all too often, and so for some reason it just doesn't seem to work for me. I then started drawing half of the profile of the camera sides using splines (Fig03), so that I could use the Lathe tool to create the geometry (Fig04). After that I drew side profile splines for the parts of the camera that would later be cut out, using the front reference image (the microphone part, and the black part on top). Once I had those splines correct, I then used the Extrude tool, and made sure that the extrude length was large enough so that it would intersect with the complete geometry (Fig05). With that done, I selected all of the geometry and copied all of it once, and then



Fig05

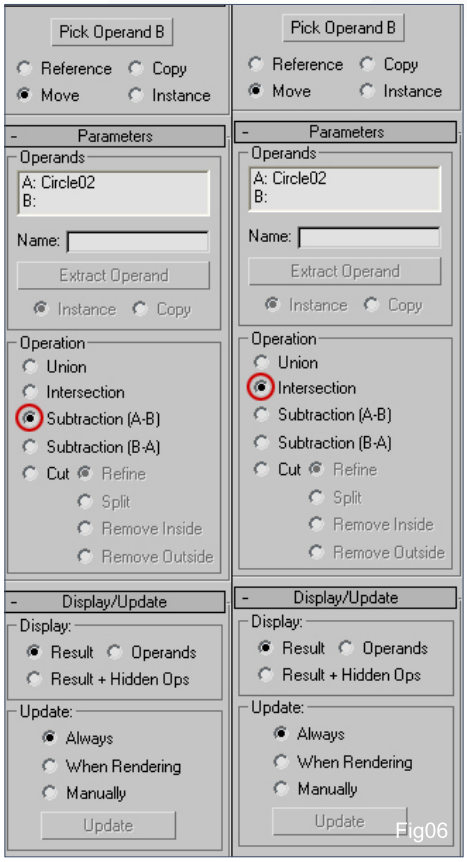
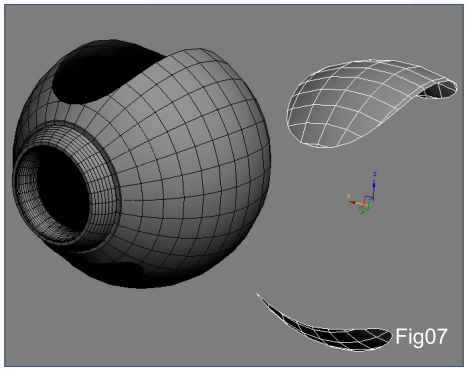
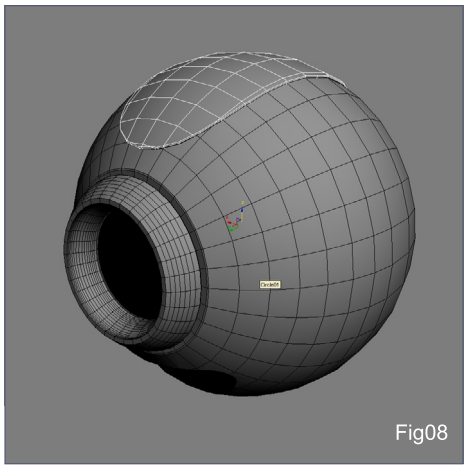


Fig06


Fig07


Fig08

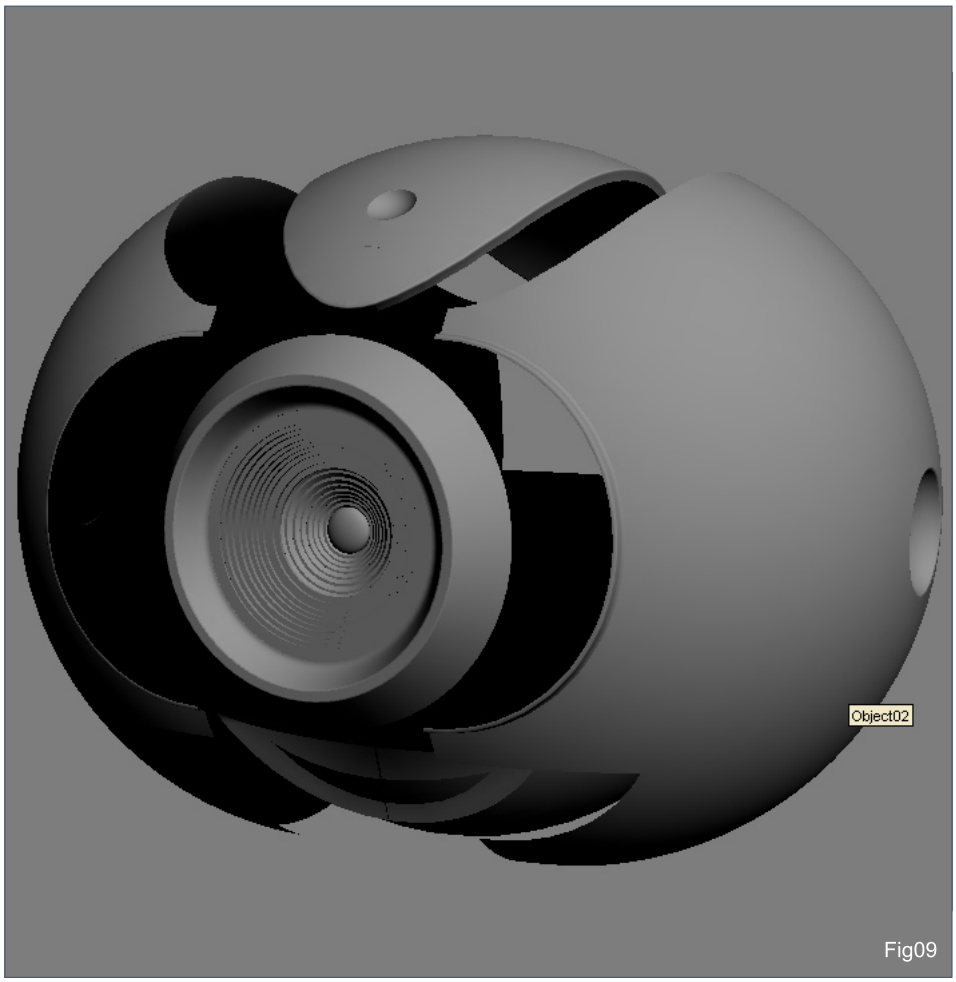
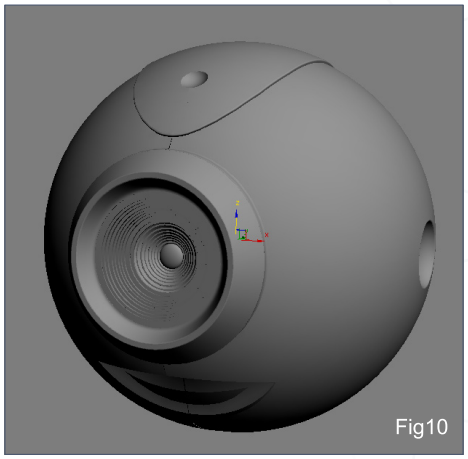


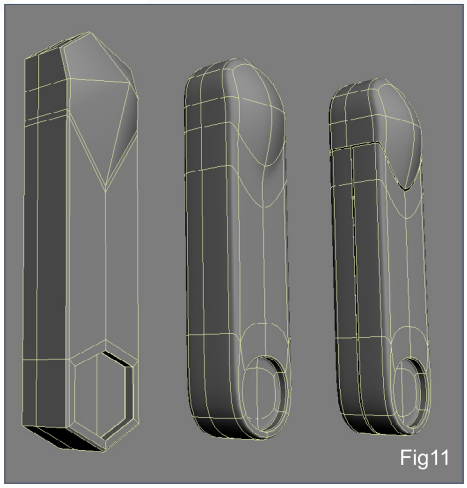
Fig09

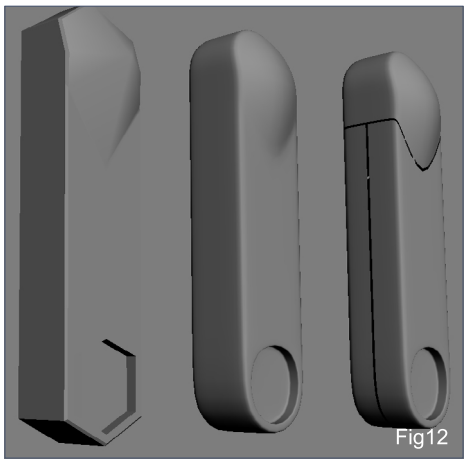
hid the copied part so that I could used the Boolean operation to cut away the parts. I then selected the geometry and displayed the other geometry. Now, since I had the cut-out version selected, I could easily hide that, leaving the un-booleaned version. I then used Boolean again, but instead set it to Intersection, which then left me with just the intersected pieces that I could use (Fig06 - 07). With the top bit of the camera's part selected, I used the shell to extrude it outwards a little, and converted it to polygon. I then deleted the lower side of it in the shell pull-down by using "select inner faces" and then converted the whole thing to poly. If you then select faces, the inner part will be selected (since you don't see this, it might as well not be there, and it saves memory). I selected the edges around the top part and used a slight Chamfer on it, followed by editing its smooth groups, so that it looked as a whole (Fig08). I did a lot of chamfering because there was going to be quite some reflection on it, especially on the black parts, and it gave a nicer, softer reflection transition than when using hard edges. With the new Mental Ray you can have this as a special effect, rather than real geometry, but I prefer it this way in case I want to use another renderer which doesn't have that same special effect. I used the same trick on the other pieces of the camera as well. And for the "mouth" part (and later also on the earplugs) I used Boolean to cut out the little holes in the mouth, and again chamfered the edges - it's all in the details! Now, if you notice, on the real camera there is a seam running around the sphere. To achieve that I


Fig10

just attached all the geometry that should have that seam into one polygon object, and then deleted half by selecting the faces, and mirrored the half. I then moved one half so that it was just slightly offset. The inner part of the camera was just basically tubes copied a couple of times and set in the right position, with a small sphere in the middle (Fig09 - 10) - and that was the head. The rest of the geometry was really just old-fashioned box modelling. I started out with a box, sliced edges into it and formed the shape of the models, making sure to make the topology so that I could later on easily detach the parts that were supposed to be black, from the parts that were supposed to be grey (as you can see in the images). I also made sure to make an extra edgeloop somewhere, so that I could use the open chamfer tool to make the seams (with small, plastic things there are almost always seams somewhere) (Fig11 - 13). And for the chest plate, I cut that out of the geometry with Boolean again, copied the copied part again, and placed one of the pieces a little way inside the chest. For the other part, after applying a shell, I again Chamfered the edges on top of the inner piece. This would later on make the Logitech lit logo appear under the chest plate, and give a better result (Fig14).

Once I had the character built I then started doing the materials, which is one of my favourite parts. I looked at the actual material of the camera and noticed that it behaved a bit like carpaint does, in terms of the colour, and the way it becomes brighter and a slightly shifted colour where the light hits it, and also has a heavy falloff in colour. Normally, I would play around with falloff maps a little, but luckily for me, Mental Ray now has a carpaint shader - so I used that. I set the colours to what I needed them to be, removed the flakes settings and lowered and blurred the reflections. I got it right in one go, so there wasn't much mystery to it at all (Fig15 - 16). For the black parts I simply used the arch material and made it black, with the RGB value of 010, 010, 010. I tried to avoid complete black because I've experienced


Fig11


Fig12

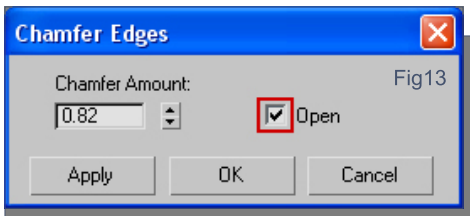


Fig13

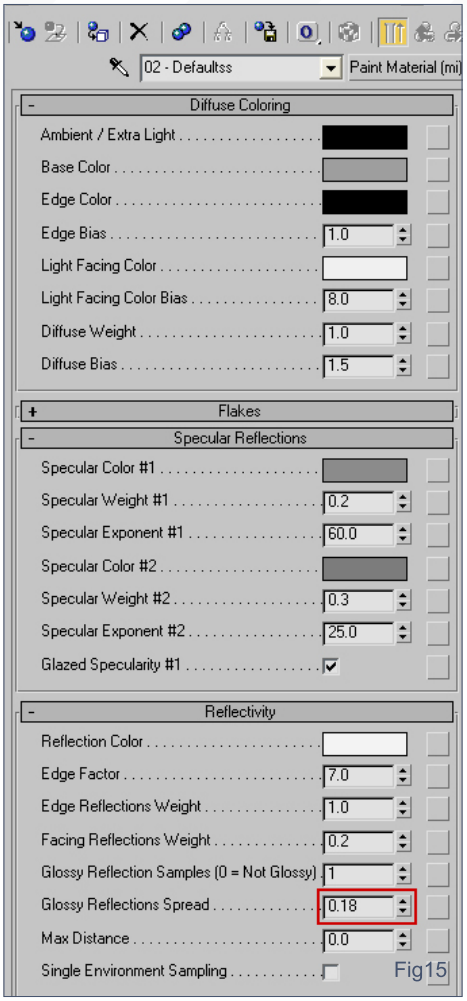


Fig15

Fig14

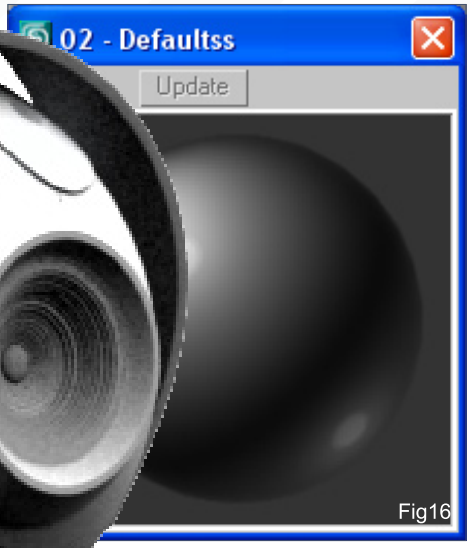


Fig16

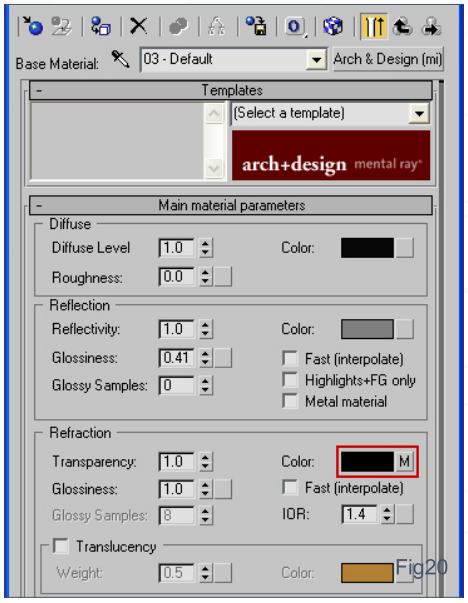


Fig20

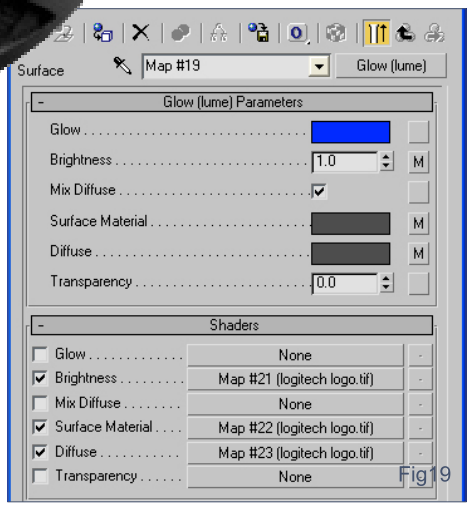


Fig19

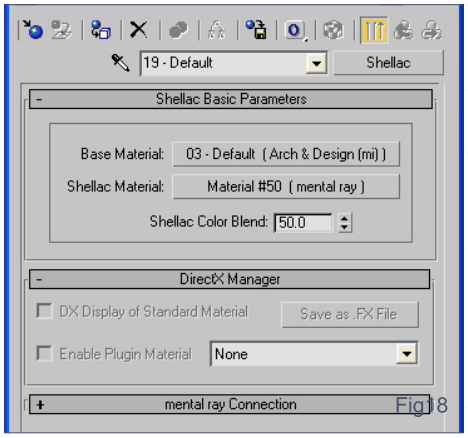
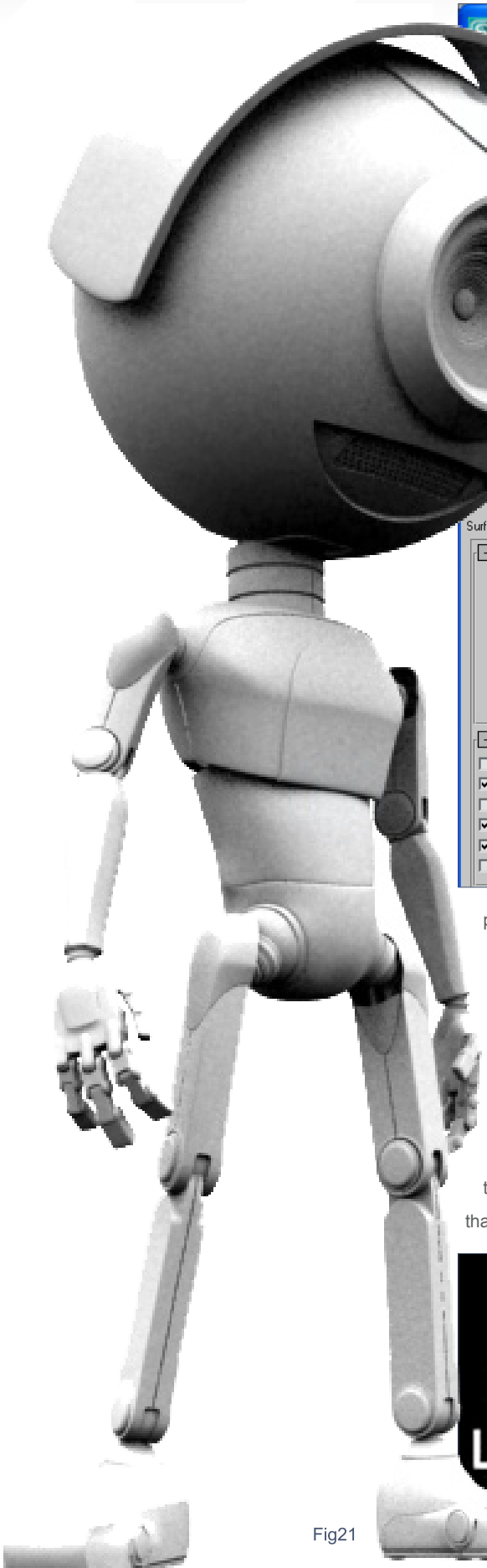


Fig18

problems with GI in the past using complete white and complete black). I used a falloff map set to Fresnel; I never use the standard fresnel that comes with materials, but instead always make my own using the map. The reason for this is that the standard fresnel may be mathematically correct, but I like it when even the part that is directly facing your eyes reflects just a tiny bit, so I can make the black part of the falloff map a dark grey. This way is quicker than tinkering with the fresnel's IOR, in my opinion. The chest plate has a small Logitech logo. I found a good sized black and white logo on Google, and took it into Photoshop. I used the "select by color" range to delete the white part of the image (I firstly made sure the background was transparent), leaving just the black part, and then inverted the black logo to white and copied that onto the alpha channel. When that was done I saved the whole image as a tiff file to keep the



Fig17


Fig21

transparency and alpha information (Fig17). In Max, I used a shellac material, with an arch and design material in the top slot. I made that black, and put the tiff with alpha information into the transparency slot (Fig18 - 20). The other material was a Mental Ray material with a lume glow in the diffuse slot. I set the diffuse colour to blue. The other slots got the tiff image again. With all that done, I finally set the shellac blend to 50, and that's basically all the interesting parts of the robot now done (Fig21).

THE CELL PHONE (Fig22)

There are a lot of Boolean operations involved with this one. Since (again) the image was not intended for animation, the topology was not so important. I started out by finding some good reference images on Google. I actually came across a good one which had the front, rear and side profiles on it, and I also happen to have the same phone myself, which is also why I made this one. I should have



Fig22

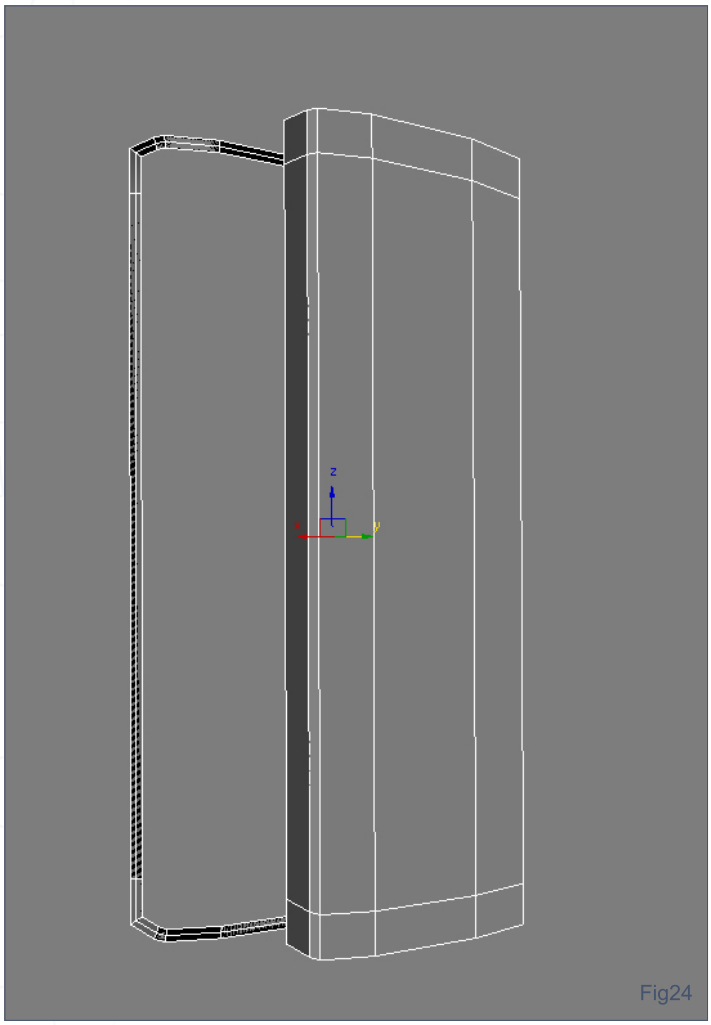


Fig24



Fig23

made a "PPBL" though because it's much prettier and more interesting to look at. The image above is not exactly the same as the one I have, as it's perhaps an earlier version of the same phone (Fig23). I cut the image up in Photoshop and positioned and applied to it some planes, as I did before with the character. Since I made this model a couple of months ago I don't have the actual images that I used now, but you should be able to follow what I did, and I have used the phone's 3D model to compensate for this. I started out with the front of the phone. I drew a plane using the front view, and converted it to polygons. I then cut some edges over it, using the slice plane tool, and edited it until it sat over the image correctly. I then moved to the side profile and edited it so that it also aligned well with the side profile (Fig24). With the front part done I could then easily do that silver line running around the cell phone, by extruding faces and tweaking them

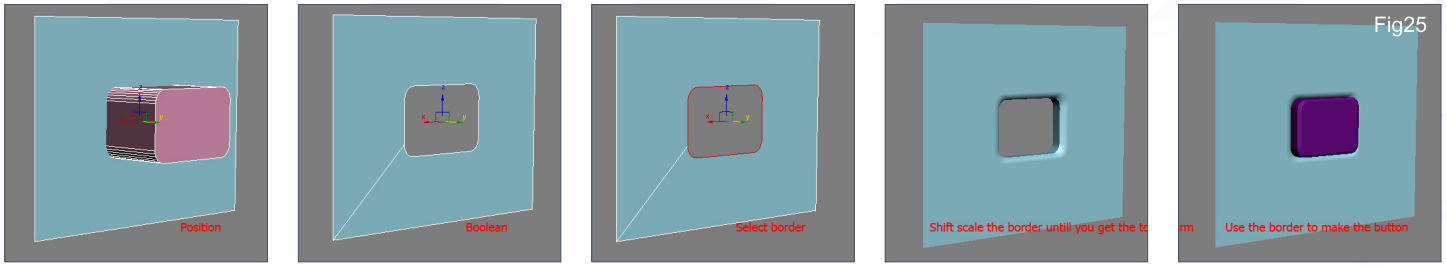
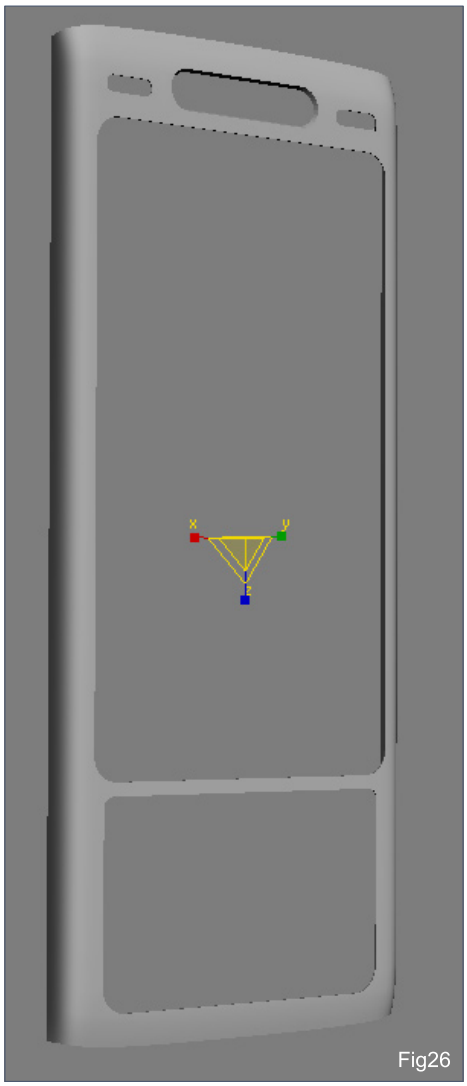
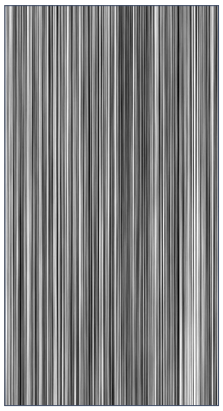


Fig25


Fig26


Fig28

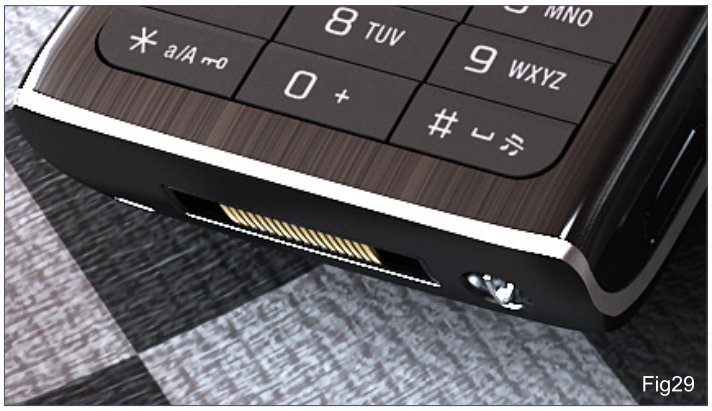


Fig29

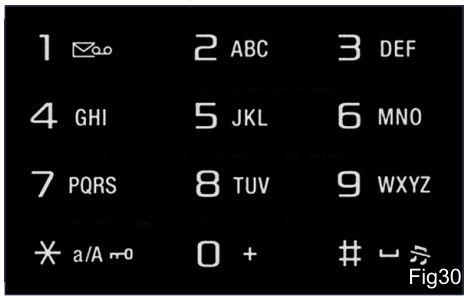
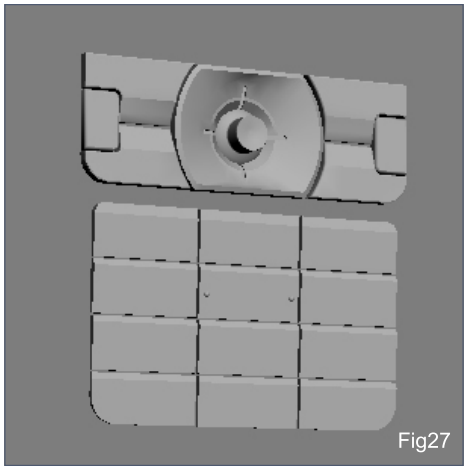


Fig30



Fig31


Fig27

into the right shape. For the back part of the mobile, I did exactly the same thing as for the front part, using a reference image of the back and side profile. That was the hardest part, and from there on in it was just a matter of cutting out the places where the screen and the buttons were supposed to come, using the Boolean. By using Booleans you can easily make the buttons by using the edges around the holes to create splines, by using the Create Shape tool in the Editable Polygon pull-down menus. I extruded those splines and used the Chamfer tool to chamfer the edges around the buttons (Fig25 - 27). With the keypads, aside from doing the above, I also made an extra slice. If you look at the phone you can see that every button has a little slice through the middle - for grip. So I made that extra slice to make the button slope up and down a little, as in the image.

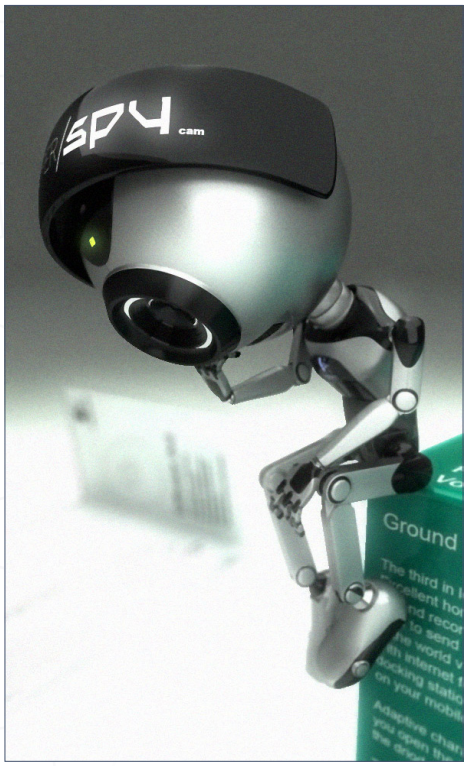
For the texturing I used arch mats; one black one, again with a fresnel and blurred reflection, which I used for the matt parts of the phone. For the front, I made a another black one with fresnel falloff, but if you look closely at the real phone you can see that it's a slightly brushed metal material (you can't really notice this on pictures, but the real phone has it). So in the falloff picture I used a noise material, setting the size to very small, and tiling was set in the Z-direction to as small as possible. This stretched the noise map and gave a brushed effect to the material. For the last part, I used an anisotropic effect to finish it off (Fig28 - 29). The silver part was just an arch mat with a high reflection, and very blurred. For the keypads I took an image of the phone into Photoshop, and

cut out the keys from the photo. Then, using contrast and brightness to edit the image, I made it extreme black and white. I used the same alpha map trick that I also used for the Logitech face plate (Fig30). I then used that to make sure that the key material had the actual characters transparent, and that the rest was filled. This way, when I put a plane behind it with a glowing material, the keys would light up, but the buttons would stay normal, as would happen with the real cell phone (Fig31). The camera part on the rear was again Booleaned, with some geometry made (there was no bump map anywhere on the model). The modelling was then finally complete (Fig31).

THE SCENE

The scene itself was dead simple. I just made a plane for the ground, and quickly painted a very simple background in Photoshop, and set it as the scenes environment background. I then positioned the character and phone as I wanted it, and positioned the camera as well. I gave the floor a slightly reflective material, and for the lighting I made 2 Mental Ray materials, set a lume glow material to the mental ray base, and gave one a blue colour, and one a yellowish,









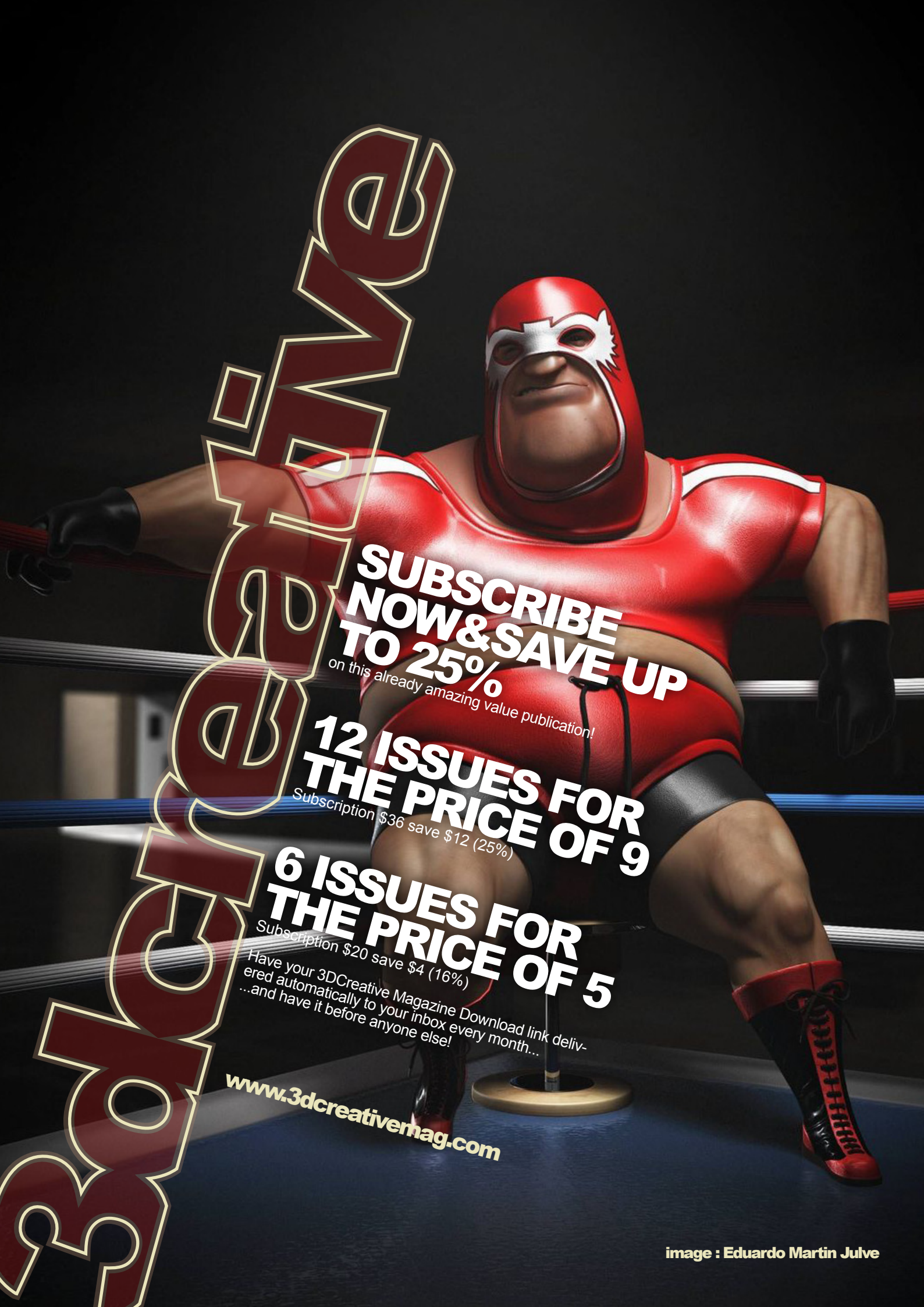
beige colour. I made sure that the intensity was set pretty high, and applied each to one of two boxes. I then set off the camera to the sides of the character. This was for the front and back light. I lastly positioned a skylight, and a directional light. The earphones and wires were made with the same techniques that I used for the rest of the models. You can see this in the images. That's basically it from start to finish, and there was not a lot of fancy tricks used, just clean, old simple modelling.

KEVIN BECKERS

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"I used 3DTotal Textures to enhance the details of the skin further. This helped to achieve the right age of the model."

Fisherman In Town

Suresh Kumar is a freelance artist from India. In this Making Of, Suresh will show us all of the texturing processes and detailing that he used with displacement maps, in ZBrush...

Fisherman In Town

Created In:

This model was created in 3D Studio Max, and detail was later added in ZBrush. The scene was rendered with Mental Ray, using its SSS Fast skin shader. The hair was created with 3D Studio Max's native hair system, "Shave and Haircut", and the texturing (skin and face) used 3DTotal Textures V4:R2 (Humans & Creatures).


Fig01

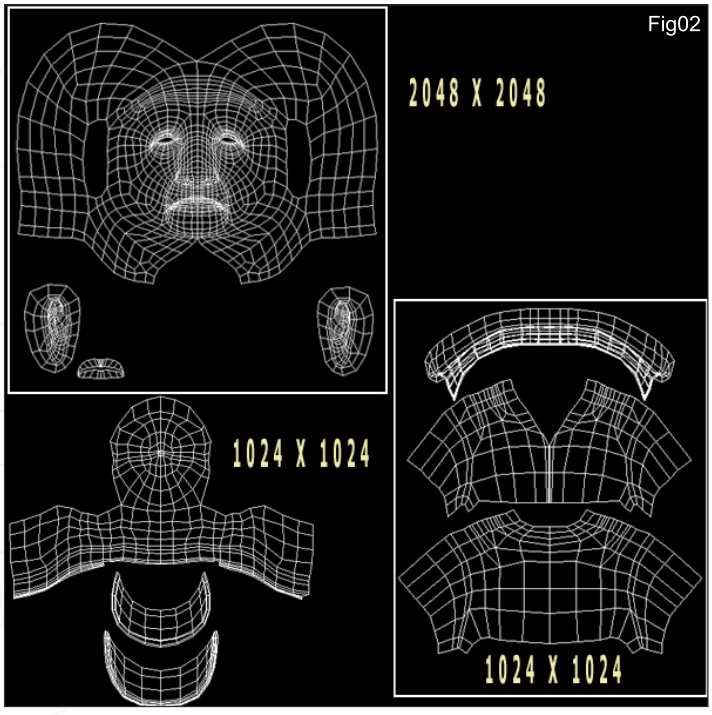
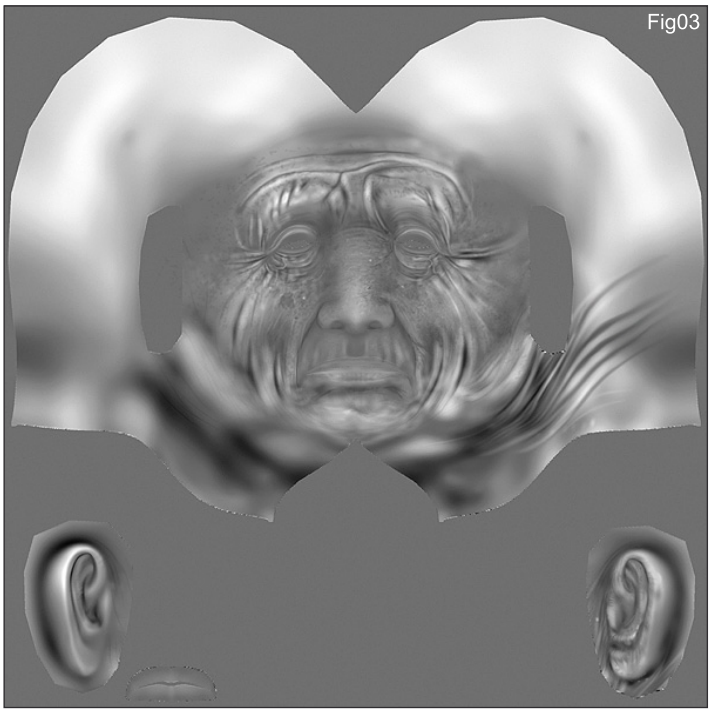


Fig02


Fig03

Creating "Fisherman in Town"

Fig01 shows the basic model of the "Fisherman in Town". Before taking the model into ZBrush for further details, I completely unwrapped the model (Fig02). I exported the model into ZBrush to add the details, like wrinkles in the skin and facial bumps. After adding all of the necessary details for the model to make it look older, I exported the displacement map with a 2048 by 2048 resolution (Fig03), and the outcome of this step can be seen in Fig04. To begin texturing I painted the face texture by applying basic colours in all the right places. I then added some small wrinkle lines to add a little more detail to the skin (Fig05). Following that, I overlaid the displacement map on top of the basic colour map, to achieve more details in the wrinkle flow. This gave me a clear understanding of where to draw the larger wrinkles in the next step (Fig06). I went on and added some dirt to the skin, and gave the skin more colour variation. I used 3DTotal Textures V4:R2 (Humans & Creatures) to enhance the details of the skin further. This helped me to achieve the right age of the model. Because my model is supposed to be an older and poor man, I added some more facial dirt, and implied an element of skin disease present (Fig07).

Fig04

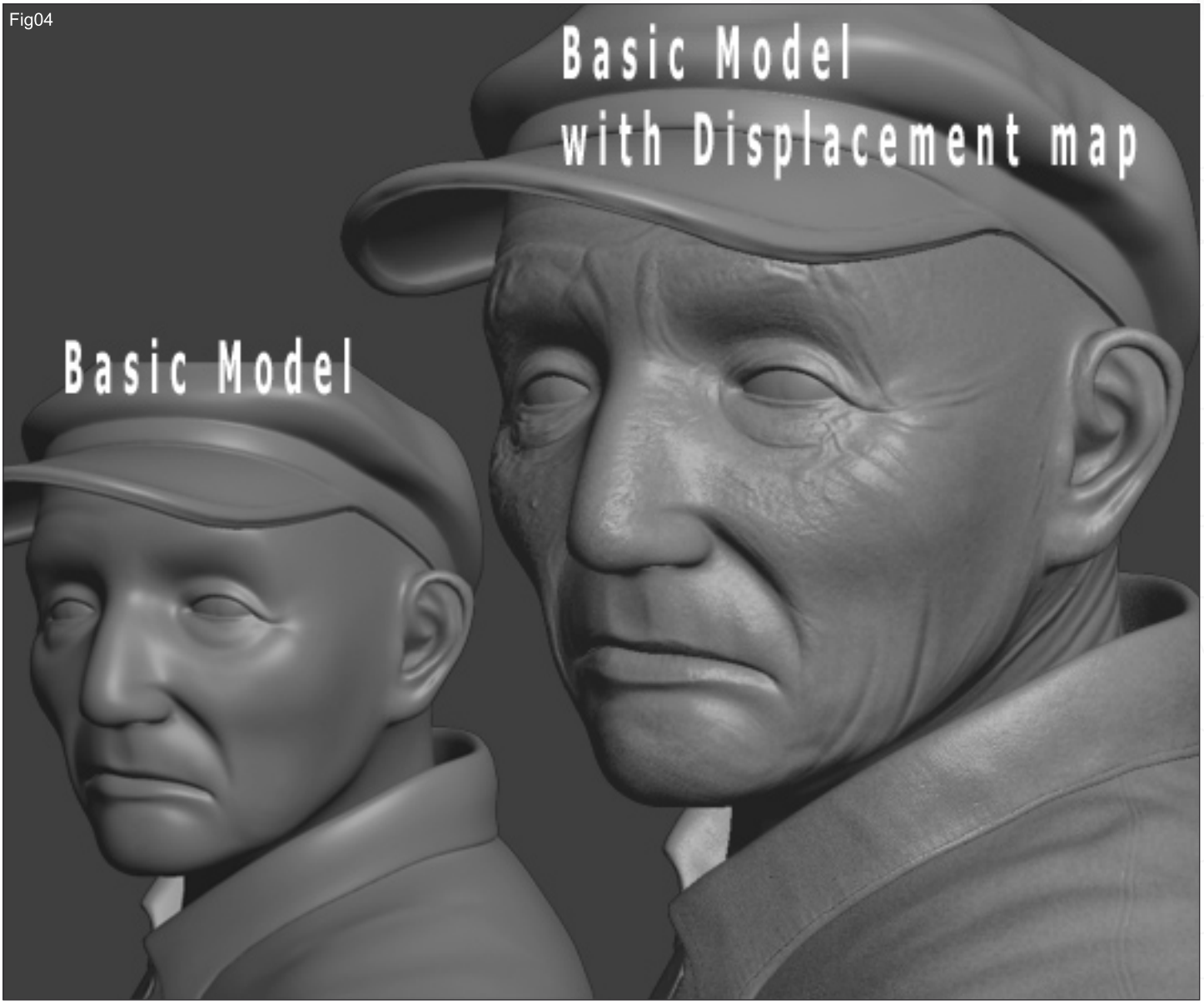


Fig05



Fig06

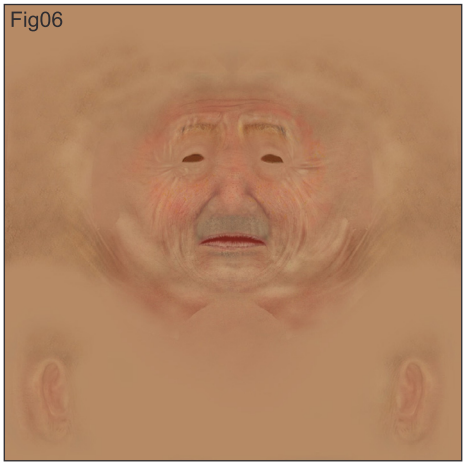
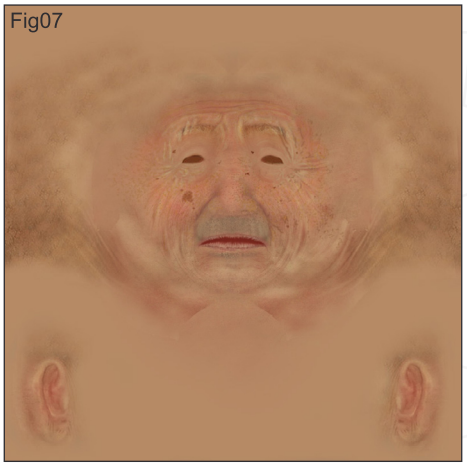


Fig07



Next, with the help of the overlaid displacement map, I painted in the big wrinkles (Fig08 - 09). This allowed more detail for the skin and the model (Fig10). I then added the tone of colour for the beard and other areas of his head, and gave more detail to the nose (Fig11). I continued by adding all of the tiny details that were needed to achieve an elderly male look in the skin (Fig12). With all of the textures painted, Fig13 shows how the model looked when rendered.

Fig08



Fig09

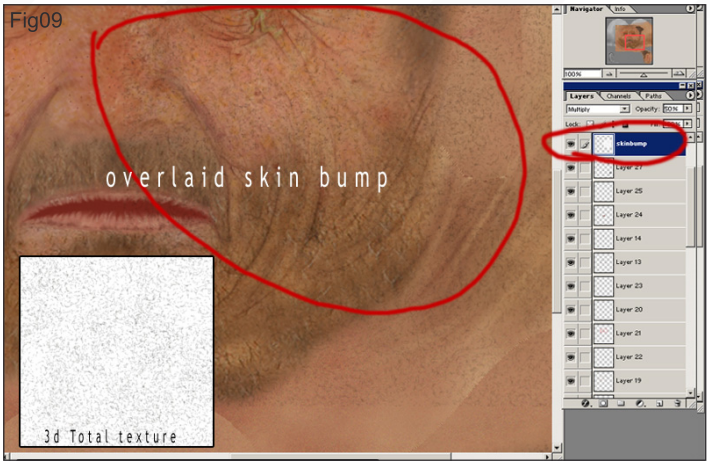


Fig10

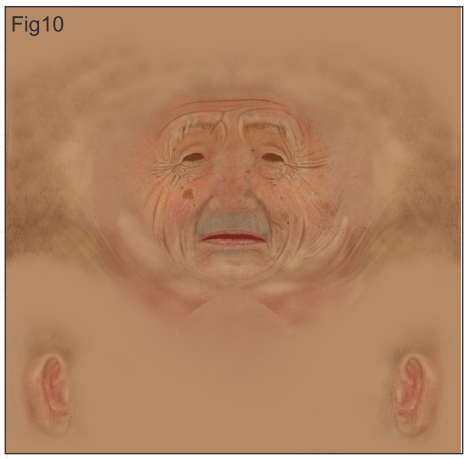


Fig11

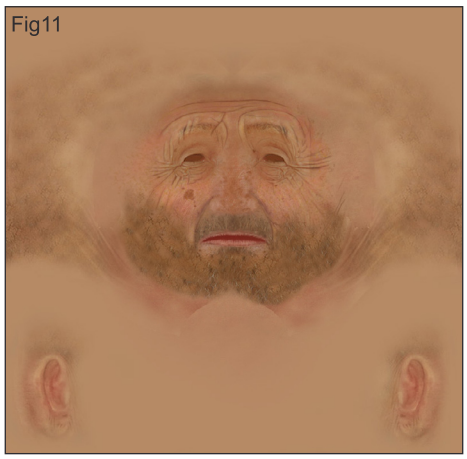


Fig12

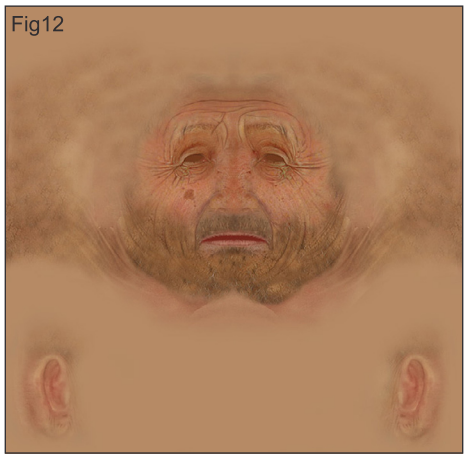


Fig13



To make the skin look more realistic, I used Mental Ray's fast skin SSS shader. For this, I needed to make two more maps: Specular (Fig14) and Translucency (Fig15) maps. I created these from the final texture colour map. Both maps had the resolution of 2048 by 2048.

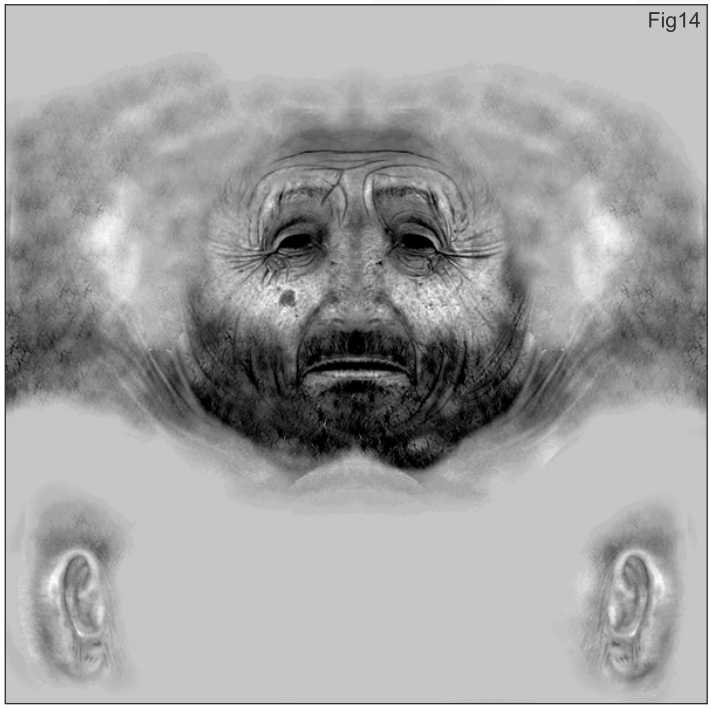

Fig14


Fig15

Fig16 shows the rendered image of the Fisherman, having used Mental Ray's SSS shader. After achieving the right skin shader with all of the necessary maps, I went on to make the hair for the model. I used two maps for the hair modifier; one for density and one for the colour of the hair.


Fig16

Fig17



Fig17 shows the hair pass for this render of the Fisherman, and Fig18 details the final render with hair and background composite. Finally, Fig19 shows the final colour-corrected render.

I hope this tutorial has been of some help to you. If you have any questions at all then please don't hesitate to contact me.

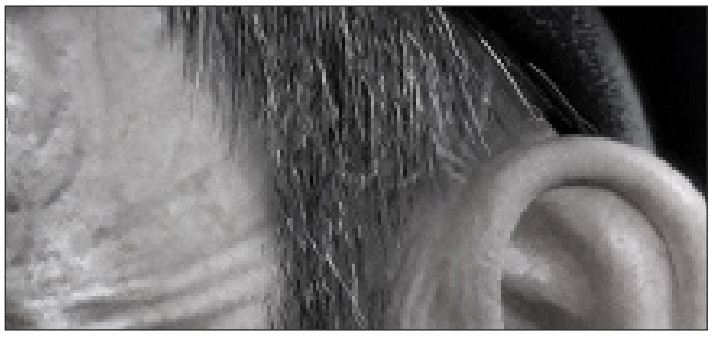
Fig18



Fig19









SURESH KUMAR

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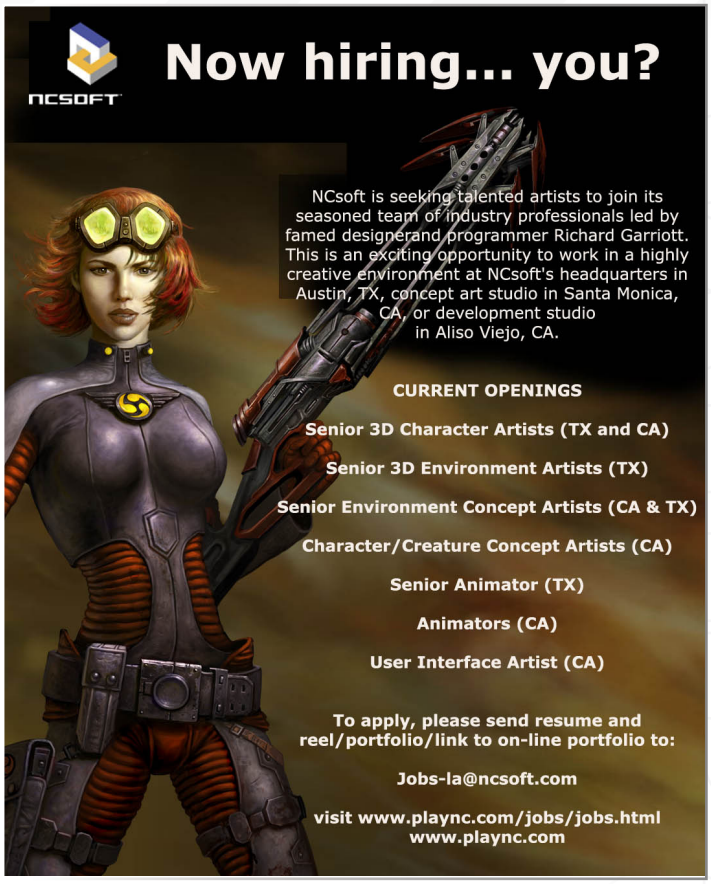
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Tuc-Tuc

3ds max

Is our new precise, step-by-step tutorial which will begin with a vehicle model and cover the principals of applying shaders, placing it in a simple scene and following with a two-part section on both lighting and render. The tutorial will begin by creating and applying materials for the various parts of the car, such as glass, chrome and tyres, as well as texturing some simple geometry that will make up a scene. It will then move onto lighting where the focus will be on setting up a lighting rig and the various parameters connected to this. Finally the series will culminate with a section on render, where the aim will be to finish with a polished image. The schedule is as follows:

Issue 017 January 2007
Applying Materials & Shaders Part 1

Issue 018 February 2007
Applying Materials & Shaders Part 2

Issue 019 March 2007
Lighting Setup & Rig (with HDRI) Part 1

Issue 020 April 2007
Lighting Setup & Rig (with HDRI) Part 2

Issue 021 May 2007
Render Part 1

Issue 022 June 2007
Render Part 2

Enjoy ...

Render Techniques Part 1

In this part of the tutorial we'll see some common render techniques in action, and we'll have a look at Ambient Occlusion and DOF (depth of field). The final part (next month) will be dedicated to render optimization (AntiAliasing techniques, image composition and retouching in Photoshop).

Let's start with the Ambient Occlusion (AO), which is a fairly recent technique to achieve more realism in render. Not so long ago you had to do some tricky stuff to obtain an AO pass to composite with the final rendered image, but finally every software package has included tools for generating AO passes directly and easily. Let's see how 3DS Max and Mental Ray handle this...

1. Open the "TucTuc_HDRI_Done.max" scene (it was included with last month's part of the tutorial) and render it. Save the result in any picture format you like (Fig 01).

2. Open the Material Editor (<M>) and create a new material called "AO_Shader". Click on the "Standard" button and choose "mental ray" from the browser (Fig 02).

3. Click on the Shader slot and choose Ambient/ Reflective Occlusion from the browser. Leave all the parameters as they are for now (Fig 03).

Fig 01



Fig 02

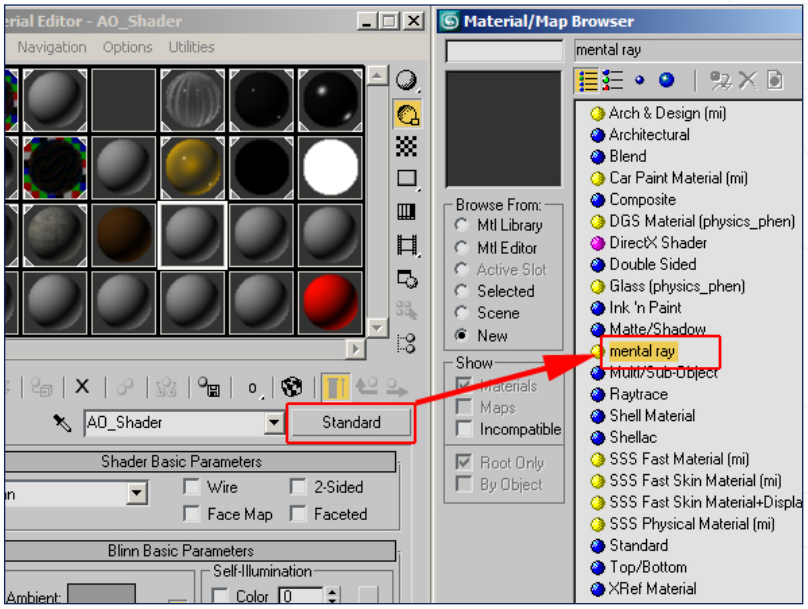
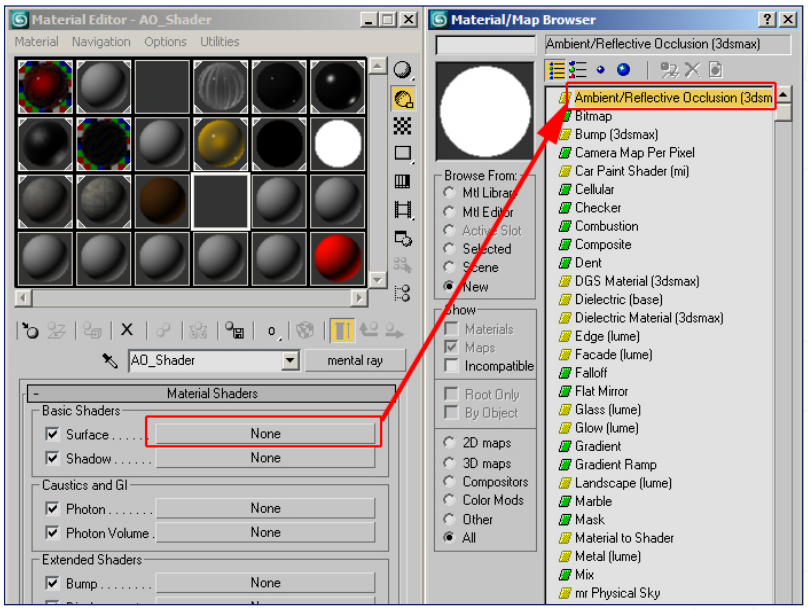


Fig 03



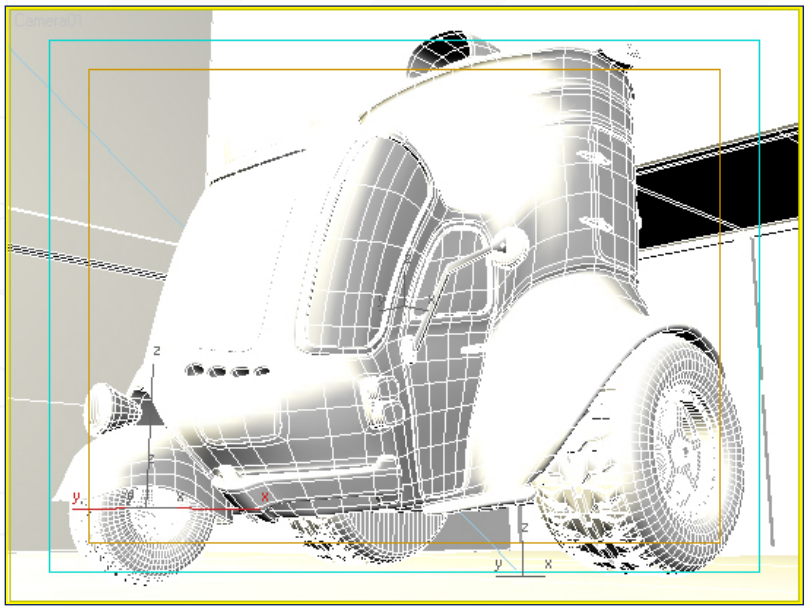


Fig 04

4. Select all the objects in the scene (<Ctrl> + <A>) and assign the AO_Shader to them (Fig 04).

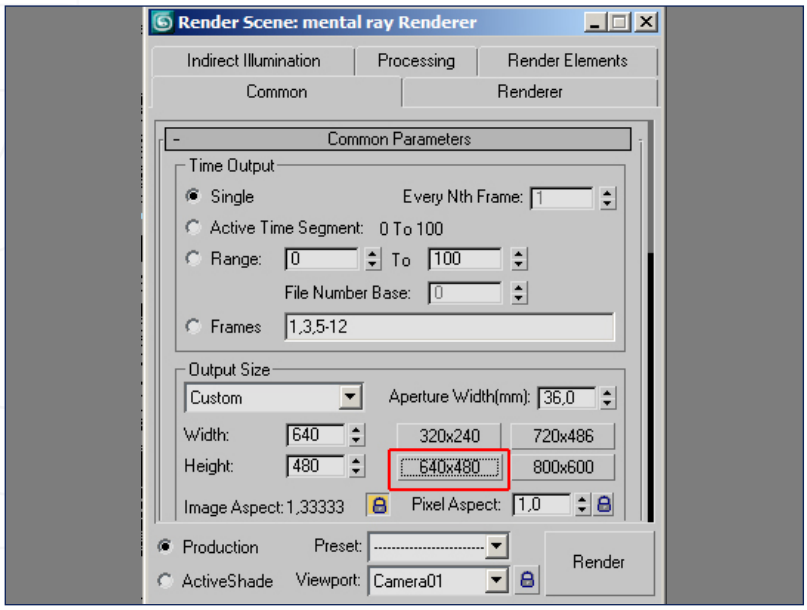


Fig 05

5. Open the Render panel (<F10>) and click on the 640x480 size preset (Fig 05).

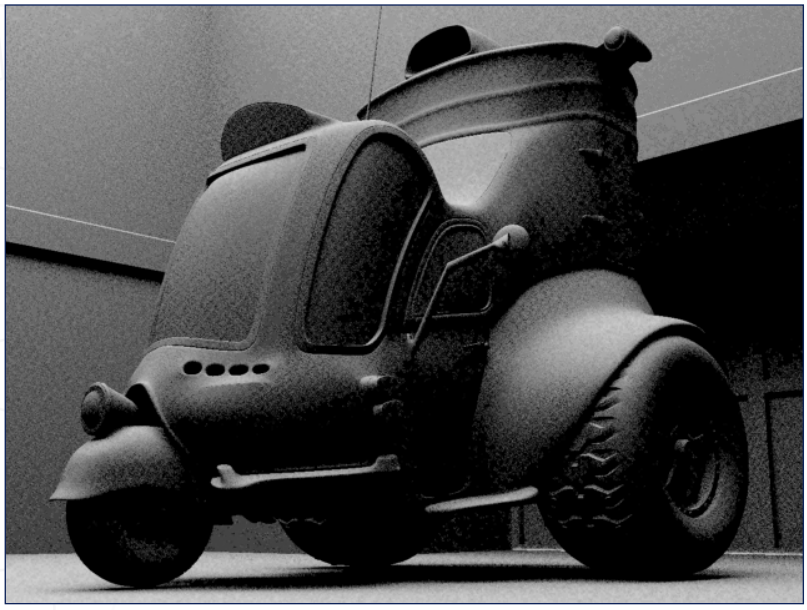
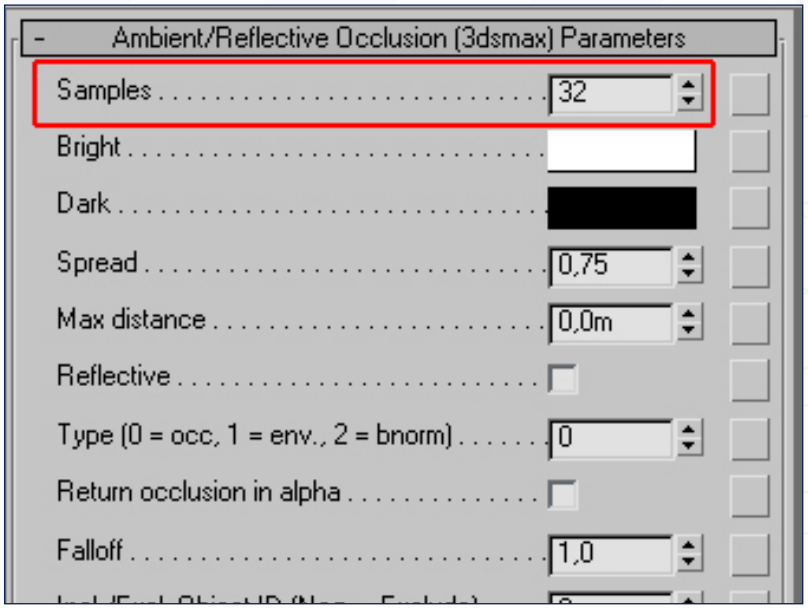


Fig 06

6. Now render the scene (<F9> for quick render) and see what happens. We will notice that mental ray rendered the Ambient Occlusion pass, but the quality of the solution is not so good, so we need to increase it (Fig 06).

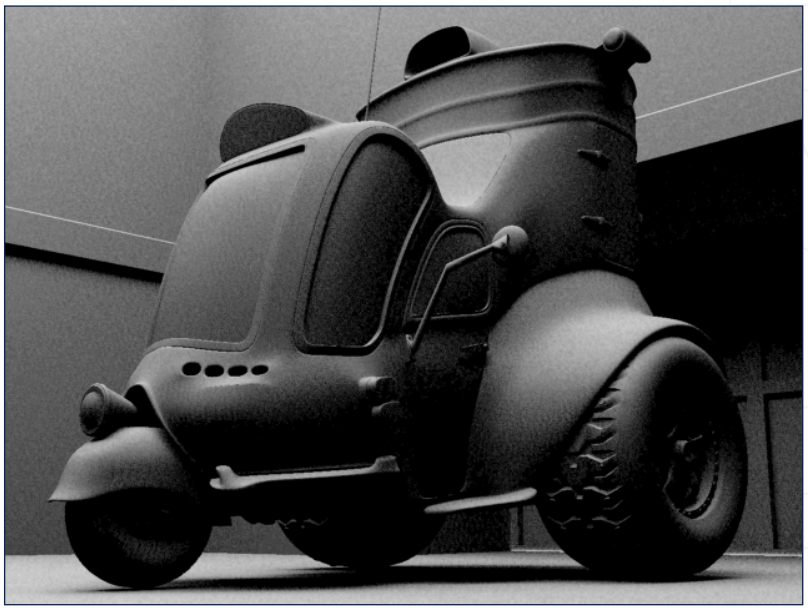
7. Go back to the Material Editor, click on the Ambient Occlusion slot and enter a higher value of Samples (Fig 07).

Fig 07



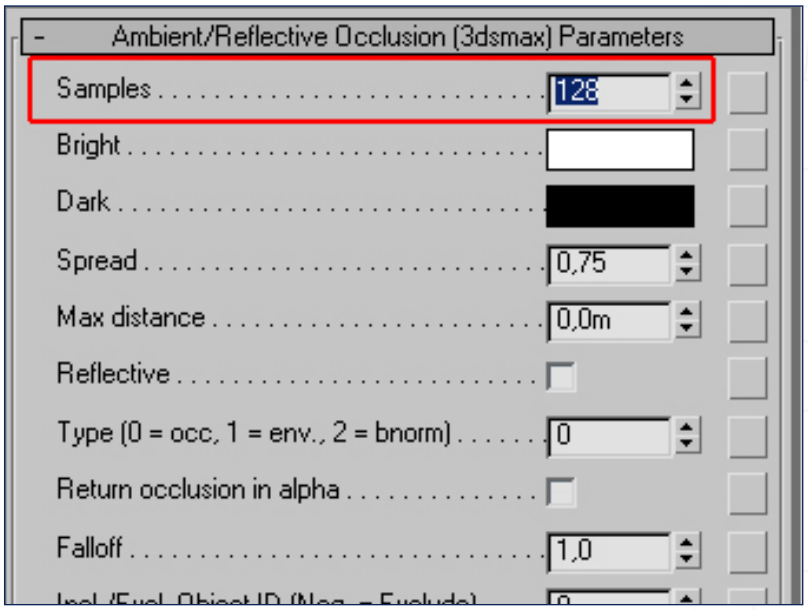
8. Render the scene. Now it looks better, but it still is not enough (Fig 08).

Fig 08



9. Enter a high value of Samples, for example 128 (Fig 09).

Fig 09



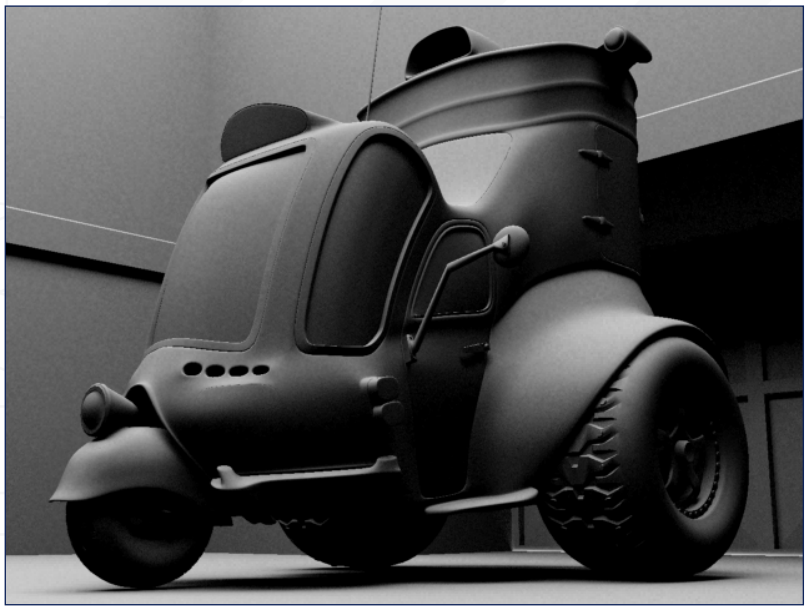


Fig 10

10. Render the scene again. Now we have a decent quality for the AO solution, and we can composite this pass over the original render in Photoshop or other similar 2D applications (Fig 10).

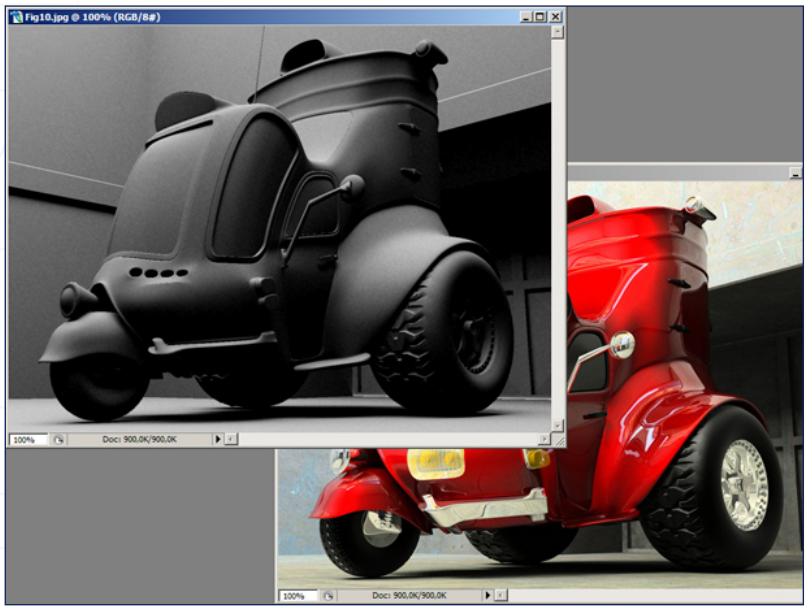


Fig 11

11. Open Photoshop and import both the original render and the AO pass (Fig 11).

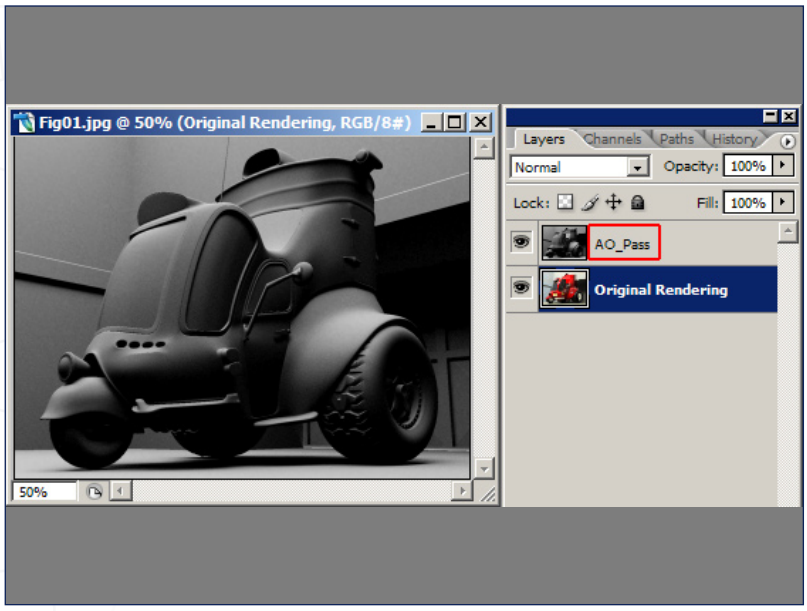
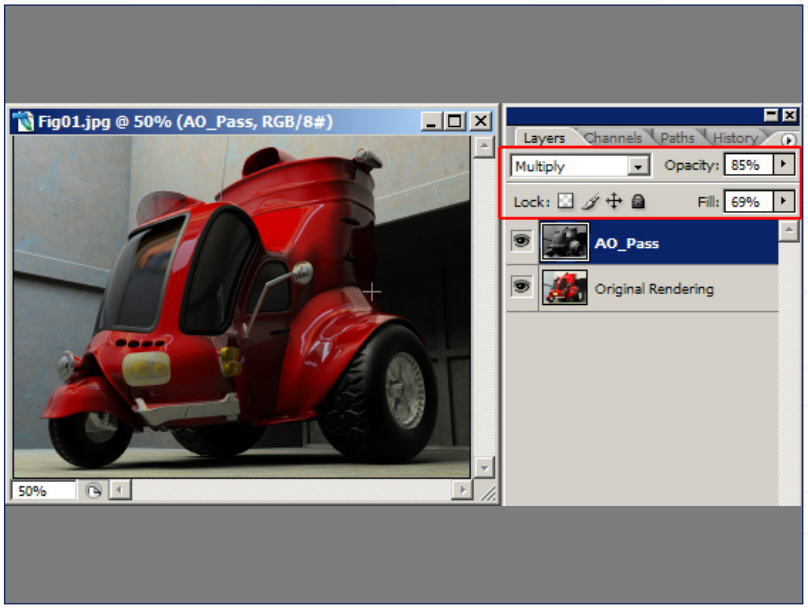


Fig 12

12. Switch to the AO pass image and Select All (<Ctrl> + <A>) and Copy (<Ctrl> + <C>). Now switch to the original render image and Paste (<Ctrl> + <V>). Rename this new layer “AO_Pass” (Fig 12).

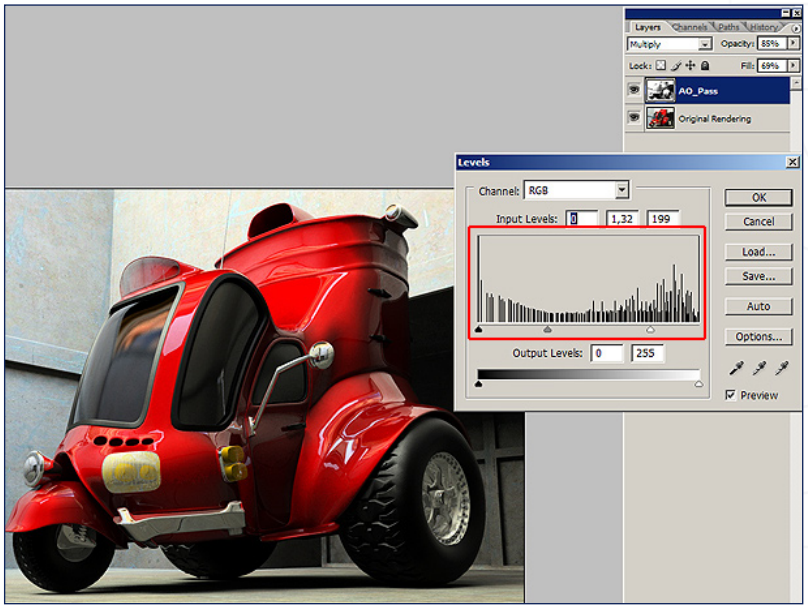
13. Change the blending mode for the AO_Pass layer to Multiply, and change the values of Opacity (85%) and Fill (69%) (Fig 13).

Fig 13



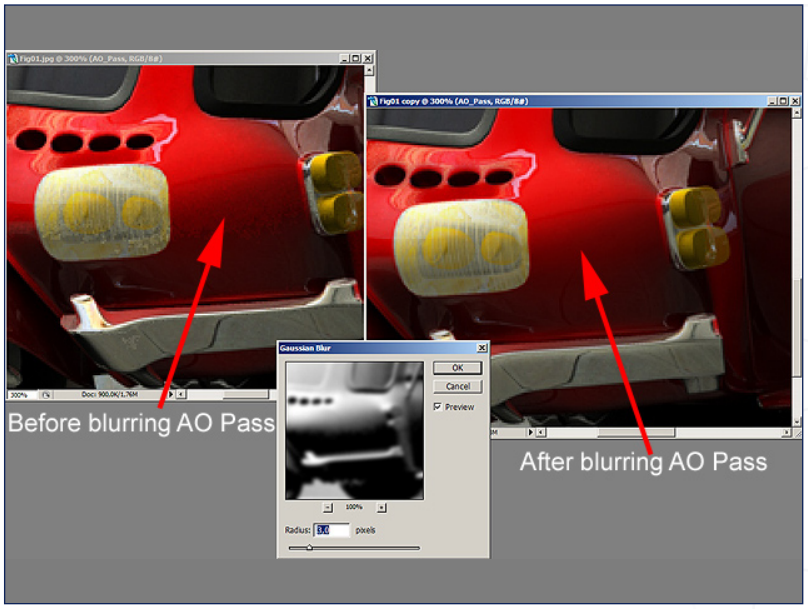
14. Now you can open the Levels window for the AO_Pass and play a little with its settings, until you get the desired result. Try not to overburn the image; find the right compromise to enhance details and shadows (Fig 14).

Fig 14



15. If you take a closer look at the composite, you may notice some artifacts caused by a low Samples value for the AO render. In this case, you can either re-render the AO pass with a higher Samples value (which may require some higher render time), or you can just apply a blur filter to the AO_Pass layer in Photoshop (which requires zero time, but it is not very precise) (Fig 15).

Fig 15



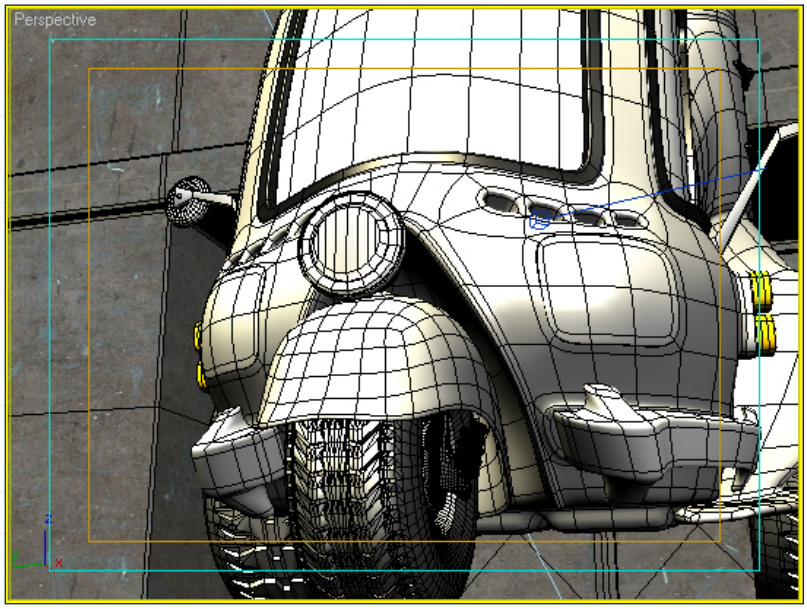


Fig 16

16. Now let's see how to create a DOF effect combining 3DS Max render and Photoshop post-production. Open the "TucTuc_HDRI_ Done.max" scene again and choose a nice shot for your render (Fig 16).

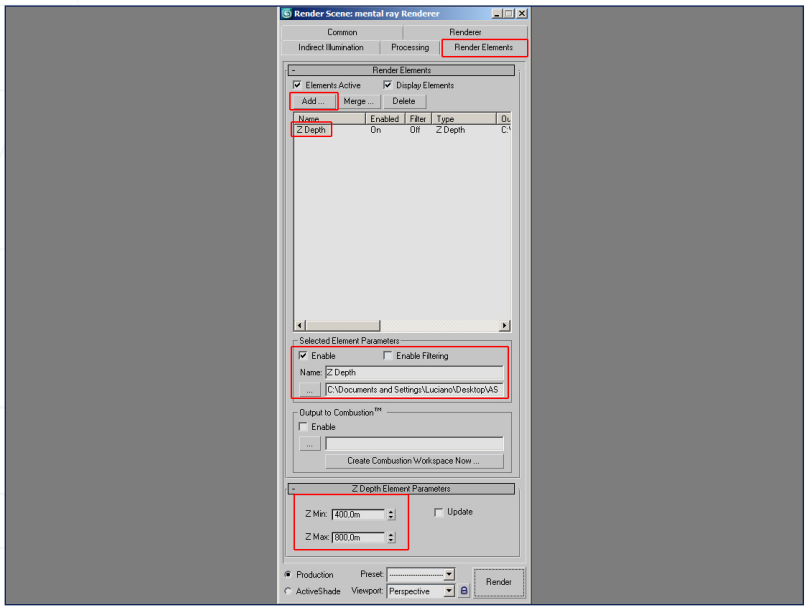


Fig 17

17. Open the Render panel and switch to the Render Elements tab. Click on the Add button and pick Zdepth from the list. Enter a destination file for the Zdepth image and change the Z Min and Z Max parameters, as shown (Fig 17). Please note that these two parameters depend upon the size of your scene and the unit you are using.

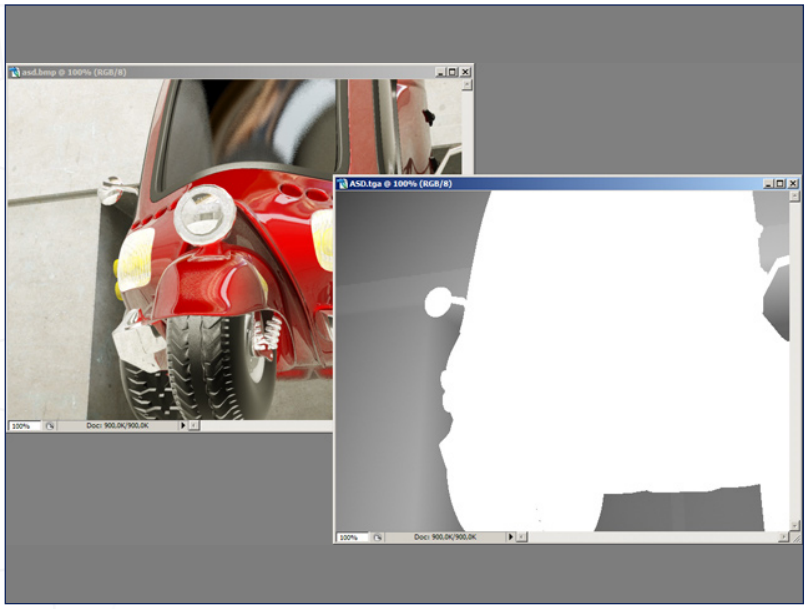
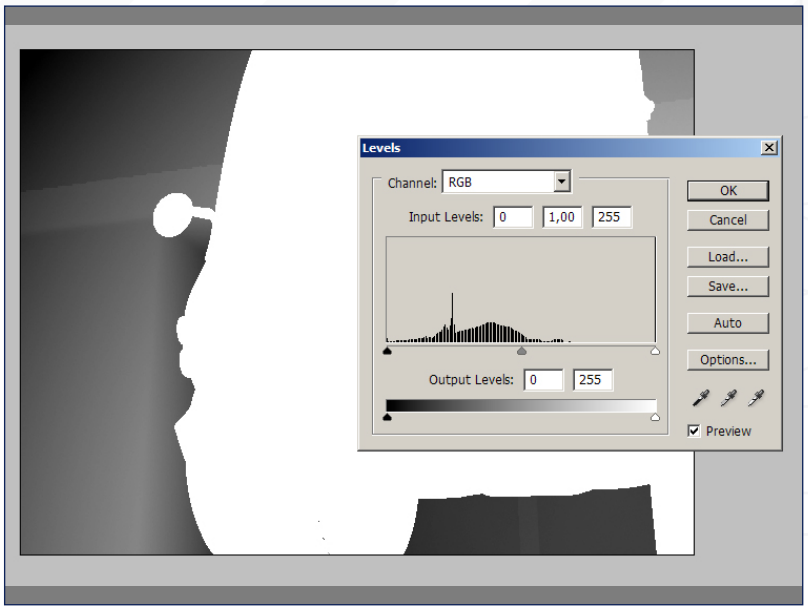


Fig 18

18. Render the scene and you will get two different images: the original render and the Zdepth image. Open both of them in Photoshop (Fig 18).

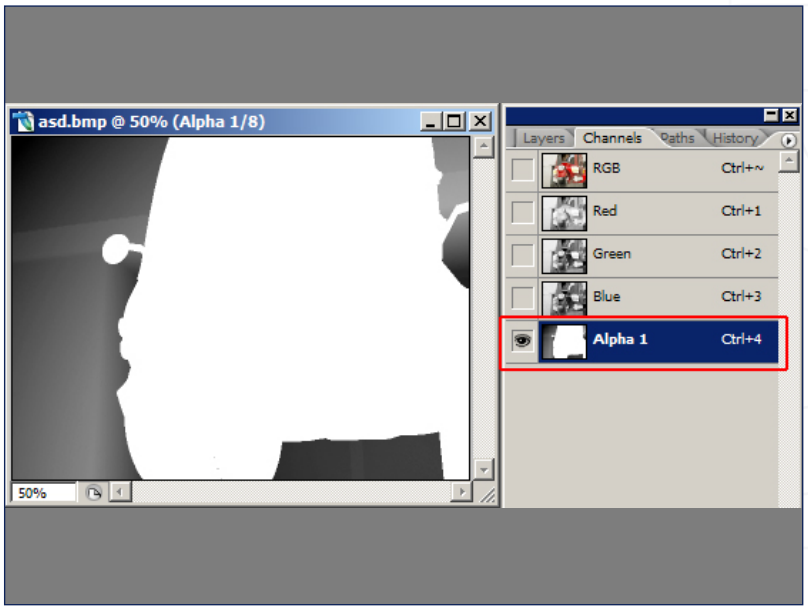
19. Adjust the levels of the Zdepth image. Keep in mind that what's full white in the picture will be in focus, and all that is pure black will be totally out of focus (Fig 19).

Fig 19



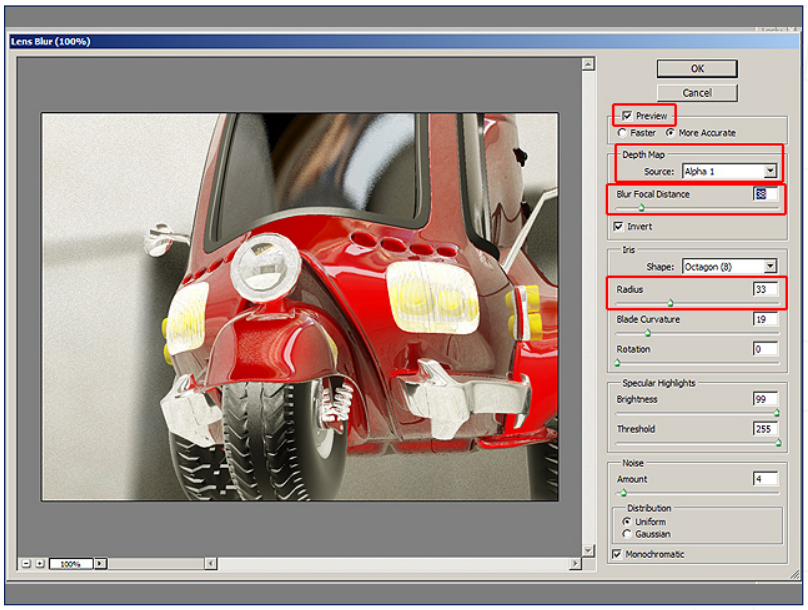
20. Select all (<Ctrl> + <A>) and Copy (<Ctrl> + <C>). Switch to the original render and Paste (<Ctrl> + <V>) into the Alpha channel. If your image does not have an alpha channel, just switch to the Channel tab and create a New Channel, then paste the Zdepth image into it (Fig 20).

Fig 20



21. Now you can apply a Lens Blur effect to the original render layer, using the Alpha channel as a source. Also, play a little with the parameters of the Lens Blur filter to get the result you want. You can also add some noise to the lower part of the Lens Blur window (Fig 21).

Fig 21



Here are some different renders combined with both AO and DOF passes. Keep in mind that you have to manually change the Z Min and Z Max values everytime you change your camera.

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Tutorial by:
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Tuc-Tuc

CINEMA 4D

Is our new precise, step-by-step tutorial which will begin with a vehicle model and cover the principals of applying shaders, placing it in a simple scene and following with a two-part section on both lighting and rendering. The tutorial will begin by creating and applying materials for the various parts of the car, such as glass, chrome and tyres, as well as texturing some simple geometry that will make up a scene. It will then move onto lighting where the focus will be on setting up a lighting rig and the various parameters connected to this. Finally the series will culminate with a section on rendering, where the aim will be to finish with a polished image. The schedule is as follows:

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Issue 021 May 2007
Rendering Part 1

Issue 022 June 2007
Rendering Part 2

Enjoy ...

Rendering Part 1

One of the most realistic ways to present a model in Cinema 4D is through the use of Global Illumination. Cinema 4D uses the term Global Illumination to describe their Radiosity solution. The Radiosity simulates the natural distribution of the light and it allows the ability to achieve realistic images: the areas of the scene that don't normally receive the light are indirectly illuminated, just as it would happen in the real world. In this first chapter of the Rendering parts I will explain all of the control parameters in the Global Illumination tab in the Render Settings control panel and how they affect image quality and rendering time...

1. Open your scene; open the Render Settings control panel; go into the Global Illumination tab and activate it. You should see from Fig 01 that the Global Illumination has its default parameters which we are going to modify for seeing what effect they have on the image quality and rendering time. You may choose the type of GI, as shown on the left of the image: Standard mode or Stochastic mode.

In this tutorial we will use the Standard mode because the Stochastic mode takes longer to render but gives a true, more accurate quality. The first parameter is the Strength that defines the intensity of GI; the Accuracy defines the precision of the GI's distribution and it is related to the samples (Stochastic Sample value); the Prepass Size parameter is the dimension of the image during the first calculation phase. The Diffuse Depth determines how far a ray will go to find a source of illumination; it defines how many times the light bounces in search of the sources. Stochastic samples is the number of rays sent out from a sample to look for a light source; Min. Resolution is the number of samples taken in a flat area; Max. Resolution is the number of samples taken in curved or detailed areas of the scene.

Fig 01

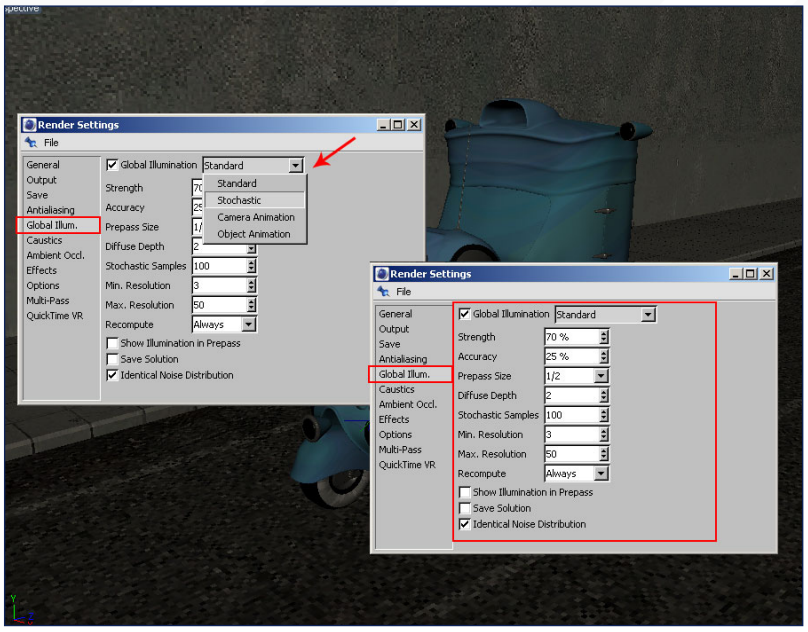
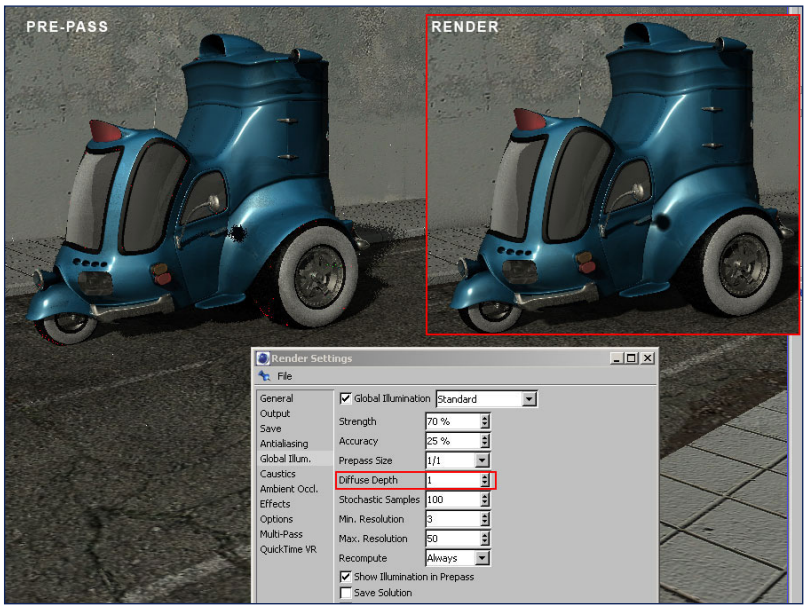


Fig 02



So, how does GI work? In the pre-pass calculation, Cinema 4D looks through the scene and finds areas of low detail and high detail. It assigns illumination points to these areas based on a combination of Accuracy, Min. Resolution and Max. Resolution parameters. These illumination points define an illumination mesh which Cinema 4D uses to determine how to light each point of each surface in the scene. The finer this mesh of light, the more accurate the results will be. Each illumination point sends out rays which are called Stochastic Samples. All of the rays from a particular illumination point are averaged together to determine how much light is arriving, and what colour the light is. In the second pass of the Global Illumination render, Cinema 4D interpolates the illumination values between the illumination points, and renders the final image based on this averaged illumination mesh.

2. Let's see now how these parameters affect the image quality. Go into the GI control panel and change the Diffuse Depth to 1 (Fig 02). This means that the ray will look at everything in it's line of sight only. A Diffuse Depth setting of 2 means that the ray will bounce one time in search of the source, and a setting of 3 means that the ray will bounce twice, and so on. On the left of the above image you can see the pre-

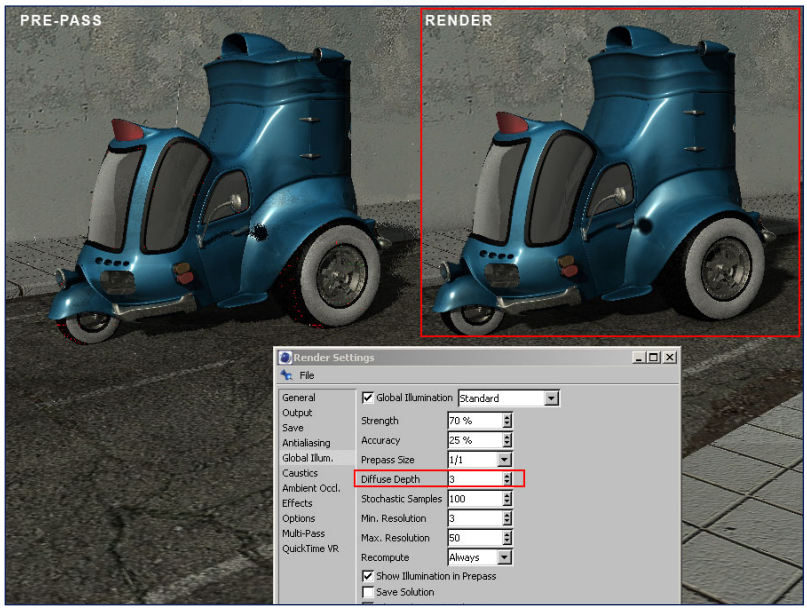


Fig 03

pass calculation, whilst on the right of figure the render is shown (make sure that the Auto Light is unchecked in the Options control panel before you launch the render).

3. Now change the Diffuse Depth to 3, as seen in Fig 03. Now you should notice that, in the pre-pass phase, the illumination points are distributed on larger areas (this is evident on the wheels). This means that those areas will receive more light.

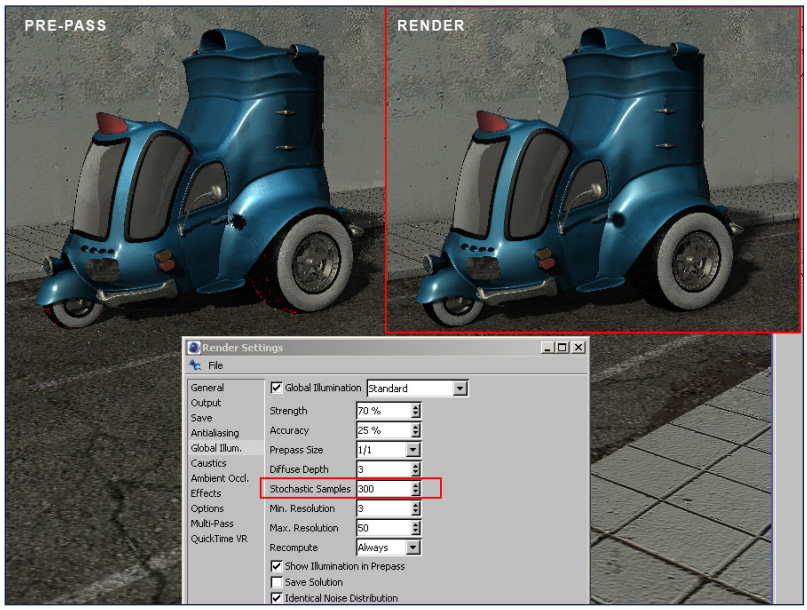


Fig 04

4. Now increase the Stochastic Sample, as shown in Fig 04, to 300. You should see from image that the scene results are brighter than in the previous render where the Stochastic Sample had a value of just 100. This will be our final value for the Stochastic Sample. You could do other tests by increasing this parameter but remember that it will take much more time to render.

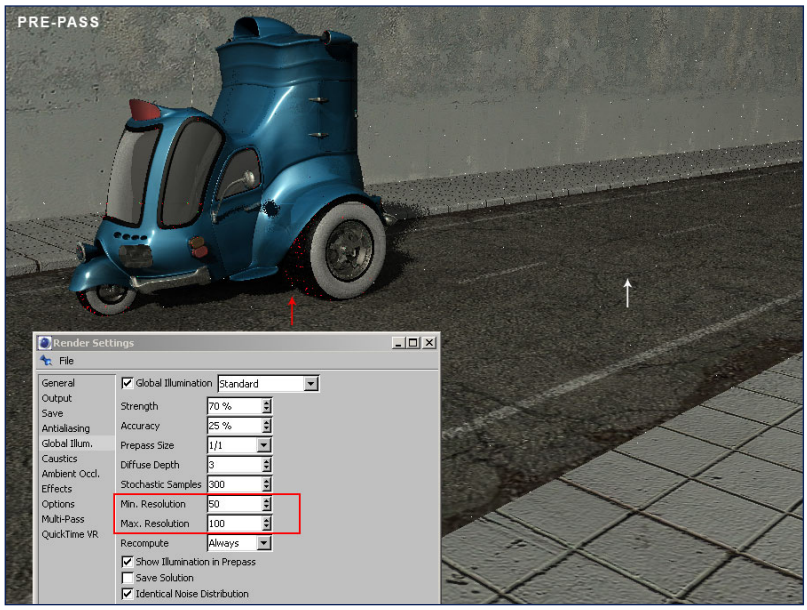
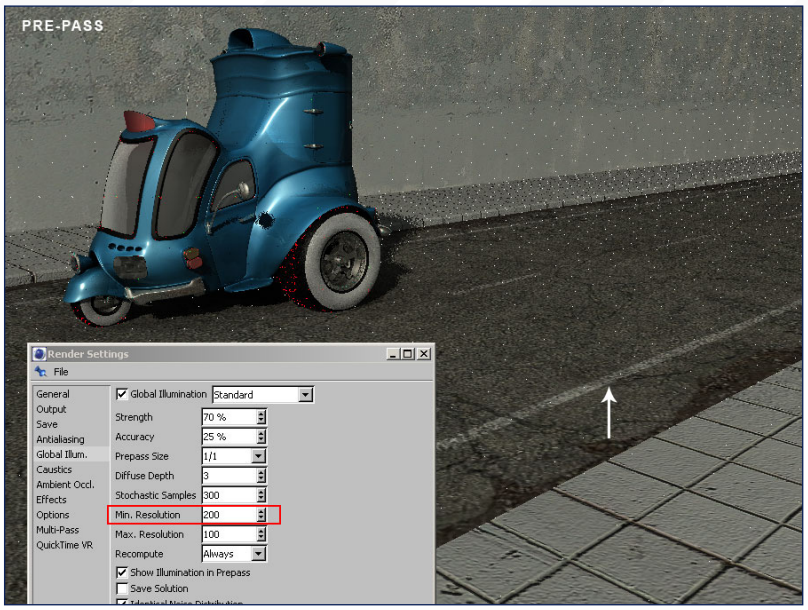


Fig 05

5. In Fig 05 I changed the Min. And Max. Resolution, and you will notice that the illumination points have increased. On the right of figure you can see some white points; these points are related to the Min. Resolution value which, as I explained in the first paragraph, defines the flat areas. The red points are more visible on the vehicle because these points are related to the Max. Resolution value which defines the curved and detailed areas.

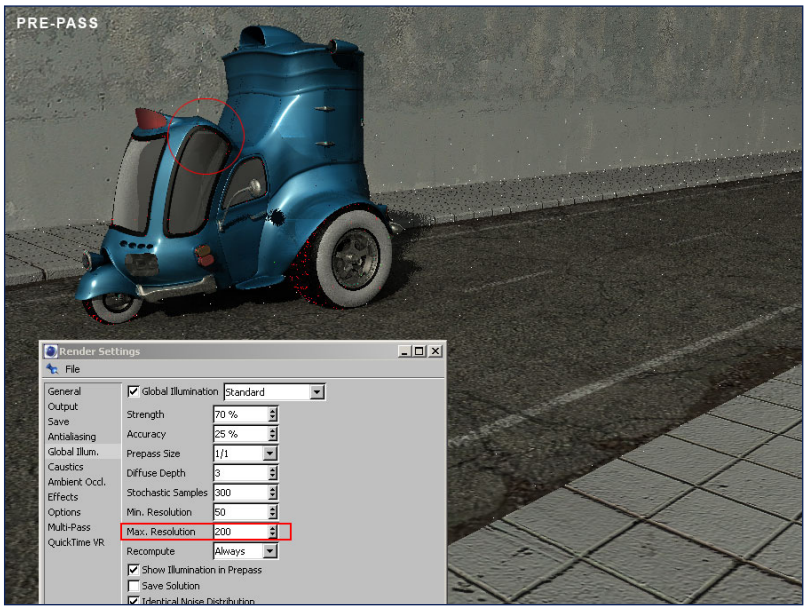
6. If you change the Min. Resolution to a higher value then the white points will increase, as can be seen in Fig 06.

Fig 06



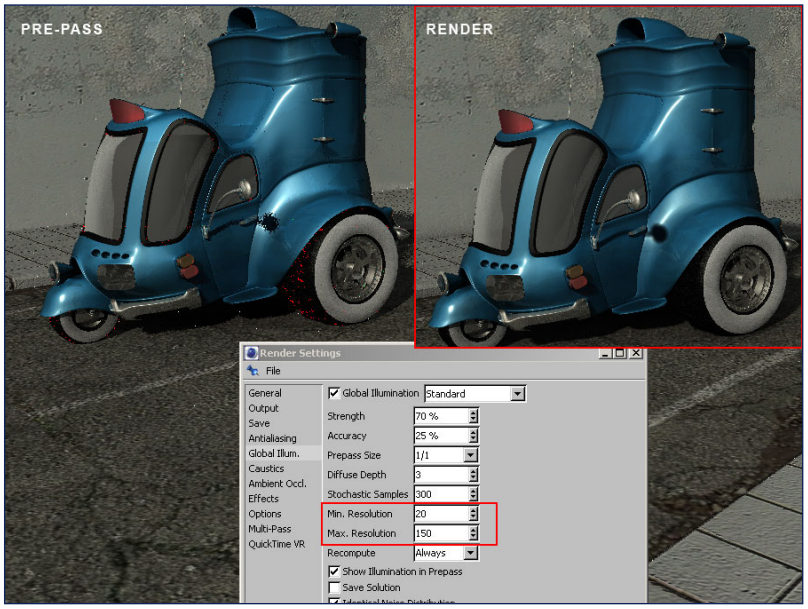
7. For the same reasons, it is worth it for the red points. In fact, in Fig 07 you will notice that the red points have a better distribution on the curved areas.

Fig 07



8. In Fig 08 you can see the final value for these two parameters.

Fig 08



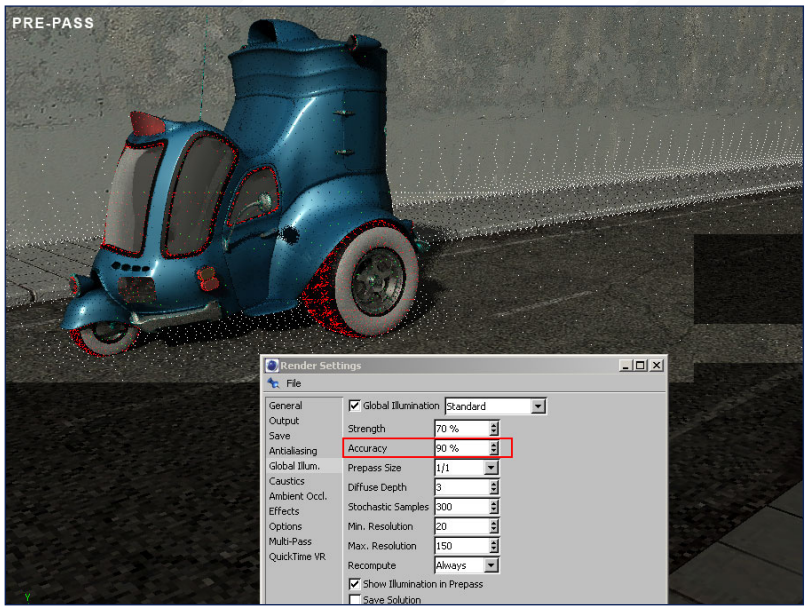


Fig 9

9. You should have noticed that our renders have some artifacts in the detailed areas. This doesn't depend upon the density of illumination mesh, in fact, if you try to increase the values of Min. and Max. Resolution parameters you will see that the artifacts will still remain in the render.

To eliminate these defects we have to act using the Accuracy parameter. Think of this value as a multiplier for the Stochastic Samples, Min. Resolution and Max. Resolution. For example, when you set your Stochastic Samples to 300, at an accuracy of 70%, you are not really getting 300 samples per illumination point but you are getting something like 200 samples per point. And at a Min. Resolution value of 70, you are really getting something like 50, and so on. So, increasing the Accuracy setting will raise all settings simultaneously. In Fig 09 you can see that I changed the Accuracy to 90%. This render of the Prepass size took about 50 minutes! You should notice from image that all points are now increased.

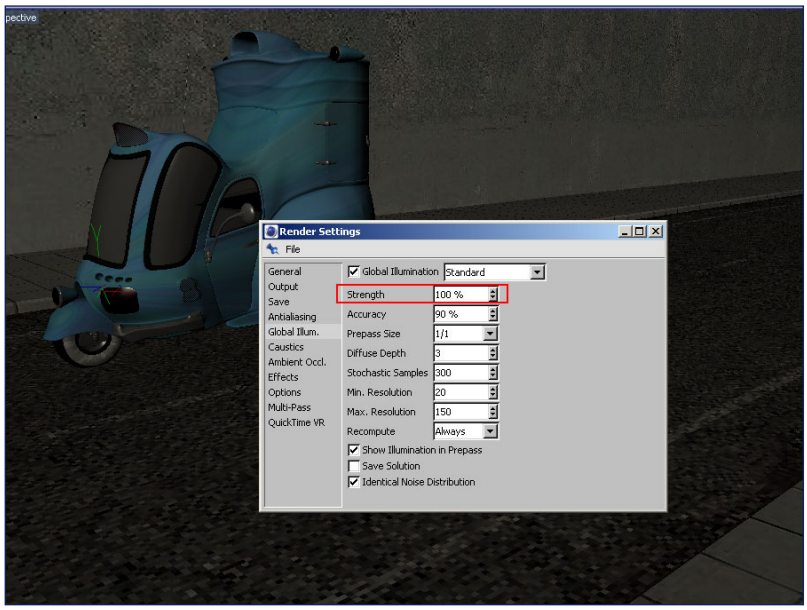


Fig 10

10. Since we want to find a good compromise between quality and time render, I suggest you to decrease the value of the Min. and Max. Resolution and the value of the Accuracy parameters. This is also because we still have to activate the Antialiasing. The last parameter that we are going to change is the Strength, so simply increase its value to 100%, as shown in Fig 10.

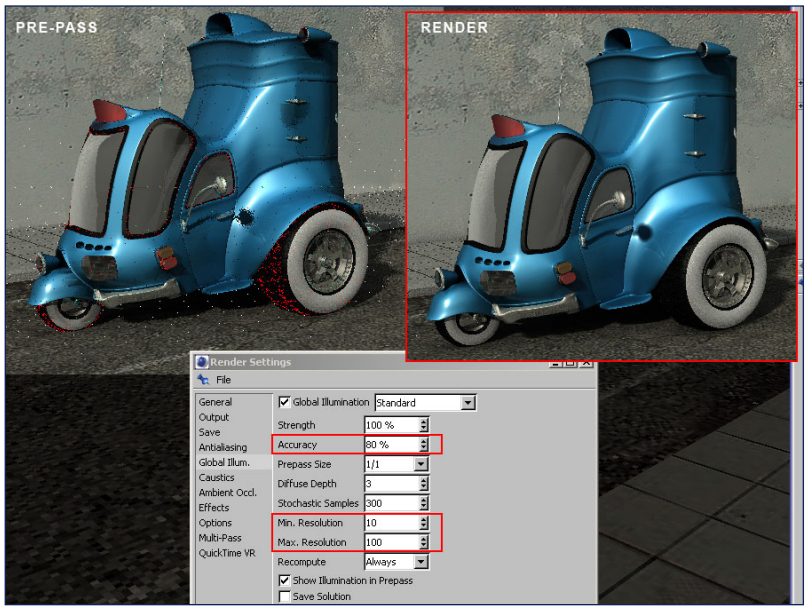


Fig 11

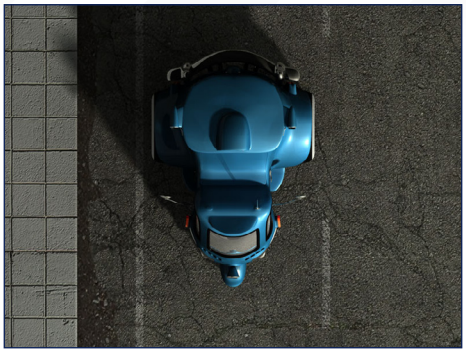
11. Here the final settings for the Global Illumination. I changed the Accuracy to 80% and the Min. and Max. Resolution, as seen in Fig 11, which decreased the rendering time. The last thing is to activate Antialiasing by using the "Best" mode. Make sure that the Auto Light is unchecked in the Options control panel. And there we have a good render!

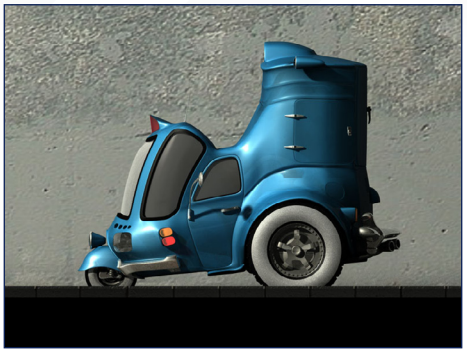
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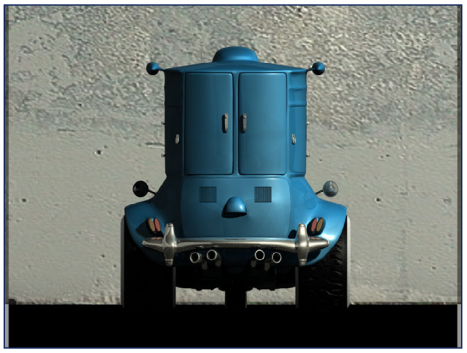
Tutorial by:
GIUSEPPE GUGLIELMUCCI & NIKI BARTUCCI

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Or contact them:
niki@pikoandniki.com













Tuc-Tuc

lightwave

Is our new precise, step-by-step tutorial which will begin with a vehicle model and cover the principals of applying shaders, placing it in a simple scene and following with a two-part section on both lighting and rendering. The tutorial will begin by creating and applying materials for the various parts of the car, such as glass, chrome and tyres, as well as texturing some simple geometry that will make up a scene. It will then move onto lighting where the focus will be on setting up a lighting rig and the various parameters connected to this. Finally the series will culminate with a section on rendering, where the aim will be to finish with a polished image. The schedule is as follows:

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Rendering Part 2

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Rendering Part 1

There are many aspects you have to consider when rendering out your images. Your choices define the style and look of your images and of course also the quality and rendering time.

As it is often the case with 3D graphics, there is not one setting that is great for everything. In this part of the tutorial, I am going to show you a few aspects that you will stumble across again and again...

1. Antialiasing removes jagged edges from your rendered images. This is done by rendering additional passes, where small offsets are added to the objects. Many effects like Depth of Field and Motion Blur work in a similar way, so they often depend on the Antialiasing settings that you choose. You can set the type of Antialiasing in the Camera Properties. There are currently 2 different approaches; the rather new PLD #-Pass settings and the Classic settings. Usually the PLD settings render faster with better quality, so unless you experience problems you should use them (Fig 01). By activating Adaptive Sampling, you can optimize render time vs. quality. Higher settings mean less accurate edge detection. 0.5 is a rather high setting; 0.1 is the standard which you can use without too many quality sacrifices.

2. The higher the settings you choose, the higher the quality of the rendered image will be. Have a look at the following comparison (Fig 02) which shows a part of the rendered images at 200% zoom.

Fig 02a was rendered in approximately 4 minutes and uses no Antialiasing.

Fig 01



Fig 02



Fig 02a





Fig 02b

Fig 02b was rendered in approximately 8 minutes and uses the Antialiasing setting PLD 2-Pass.



Fig 02c

Fig 02c was rendered in approximately 20 minutes and uses the Antialiasing setting Classic, Low - which means 5 passes. If you remember the settings and render times from the last parts, we had 30-40 minute render times with PLD 5-Pass Antialiasing (Fig 02).

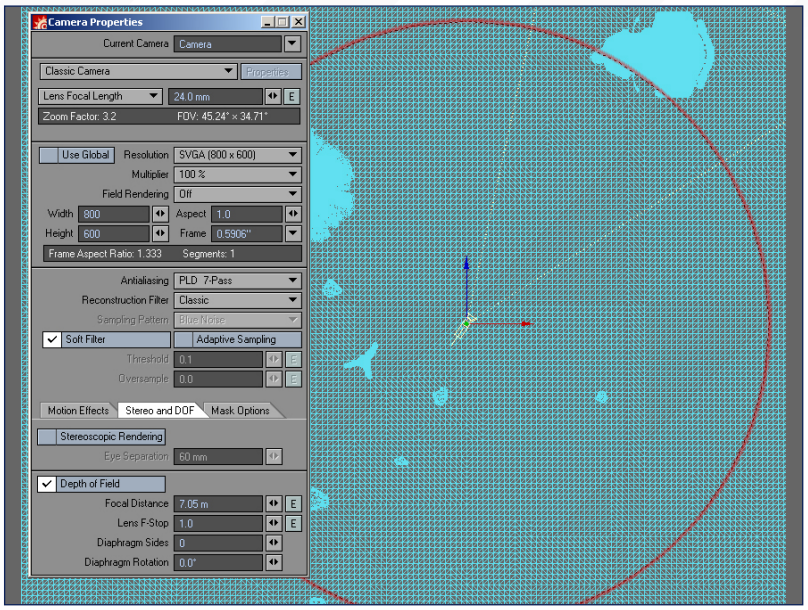


Fig 03

3. If you are not using Depth of Field or standard Motion Blur, and therefore don't need Antialiasing, you can render at twice the resolution and deactivate Antialiasing. If you need an 800x600 pixel resolution, you should render it at 1600x1200 and then simply scale the image down in Photoshop. Using bicubic resampling whilst resizing, the result might have a similar quality to Classic, Low or even Classic, Medium, depending on your scene. This trick is useful from time to time, especially when you are composing a lot of different elements into one image and when working with lower resolutions or animation. Take a look at the image quality after 13 minutes of rendering (Fig 03).

4. Depth of Field can greatly enhance the look of your image. The setup is simple, you just type in the distance to the object in focus of the camera, and the Lens F-Stop value. The Focal Distance value can be seen in Open GL feedback, so you simply change the value until the black ring crosses the section of the object you want to see sharp. For the Lens F-Stop you have to try out which setting is the best for the look you wish to achieve. A good value to start with is 1.0, which has been used for all final rendered images of this scene (Fig 04).

Fig04



5. A Lens F-Stop value of 0.5 will make the background very blurry, slightly before and after the point that is in focus (Fig 05).

Fig 05



6. A value of 2.0 makes a smoother transition to the blurred background. This is already a very subtle DOF effect (Fig 06). Keep in mind that you need higher Antialiasing settings for quality DOF. PLD 7-Pass is the minimum setting.

Fig 06



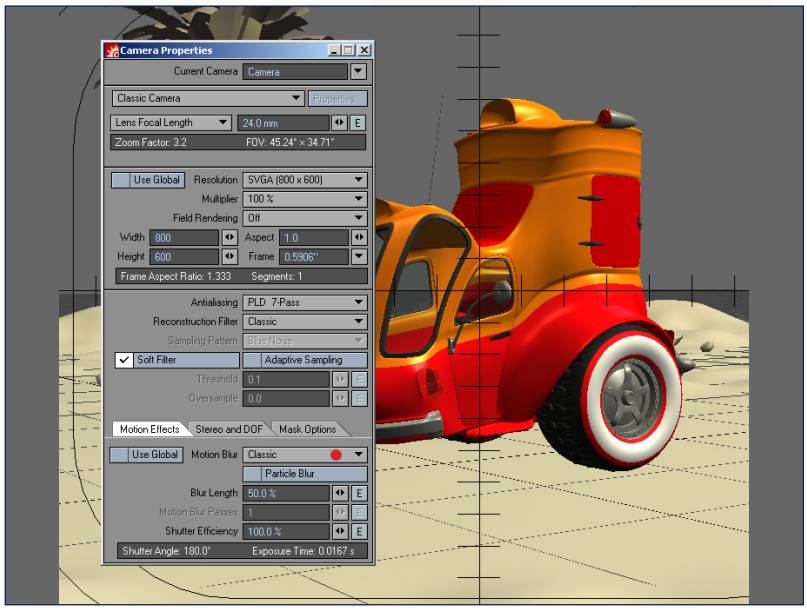


Fig 07

7. Motion Blur is usually used to show the speed of moving objects, not only for animation but also in images. If you remember, we used it for the “spinning light trick” to smooth the motion of the shadow (take a look back at part 4 of this tutorial for more information). Fig 07 shows the Motion Blur setting that we used for the spinning light trick.



Fig 08

8. Any Antialiasing setting enables Motion Blur, but as with DOF you might want to use higher settings for better quality. In this example I rotated the Tuc-Tuc around 720° at frame 2 and made a render at frame 1. Antialiasing was set to “PLD 15-Pass” (Fig 08). This is still not very smooth, so you might need to use even higher settings once you require motion blur.

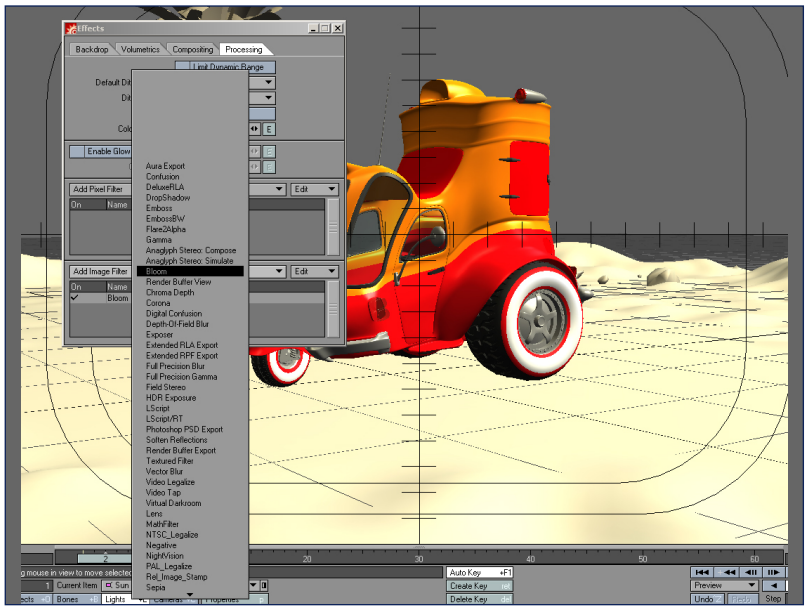


Fig 09

9. With Image Filters you can add additional effects to your image and choose different output options. In the Image Processing tab you can add the effect of your choice. There are also many free plug-ins that you can find on the Internet for additional effects (Fig 09).

10. Two filters that come with Lightwave are quite useful. The first one is the Bloom image filter, which can be used for highly reflective surfaces in sunlight (Fig 10)...

Fig 10



11. The second one is Virtual Darkroom. In the default settings, this creates the look of an old image (Fig 11a - b).

Fig 11a

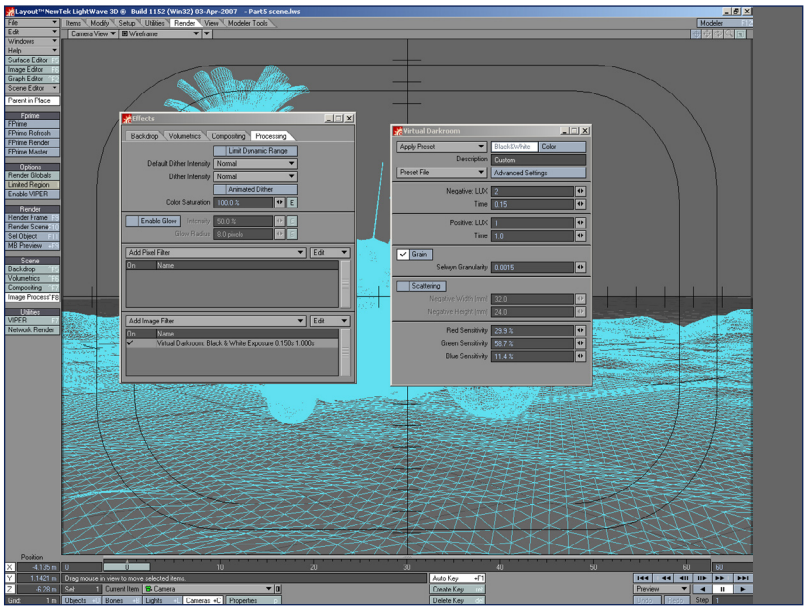


Fig 11b



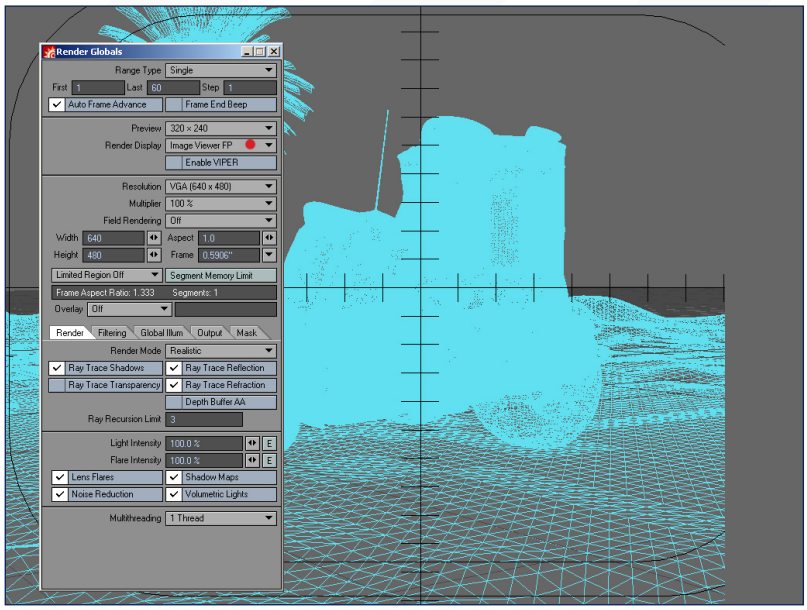


Fig 12

12. In Render Globals choose the Render Display “Image Viewer FP” (“FP” stands for Floating Point). This viewer enables image controls where you can set the Exposure for your image. Every image you render in Lightwave is a HDR Image. This viewer is a possibility to change the image immediately after rendering (Fig 12).

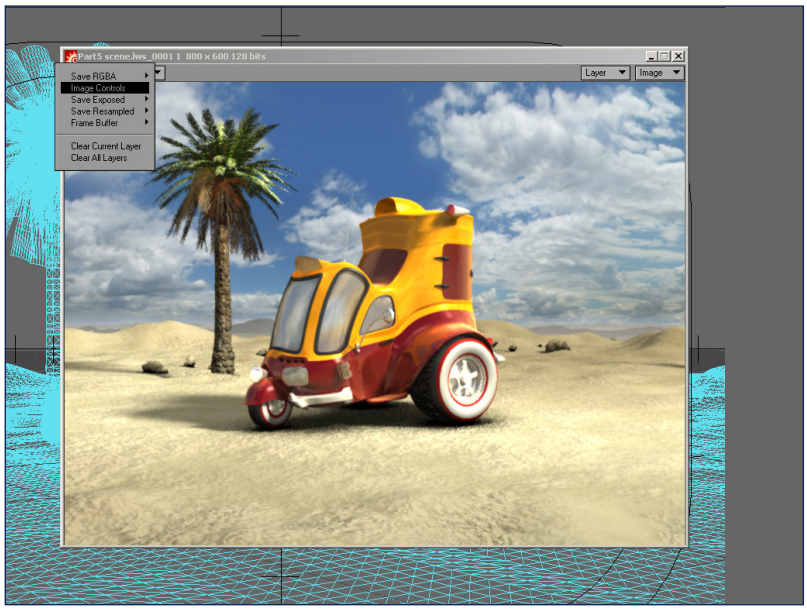


Fig 13

13. In the Image Viewer click on “File”, followed by “Image Controls” (Fig 13).

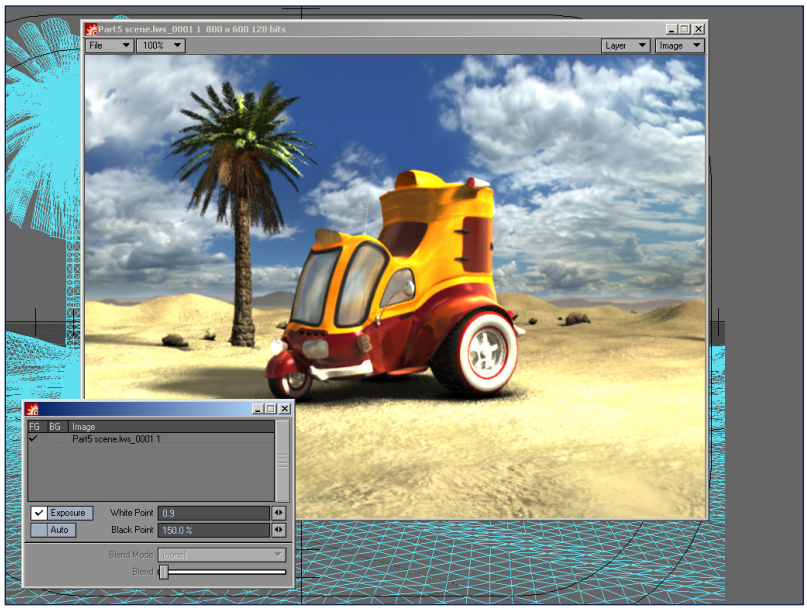


Fig 14

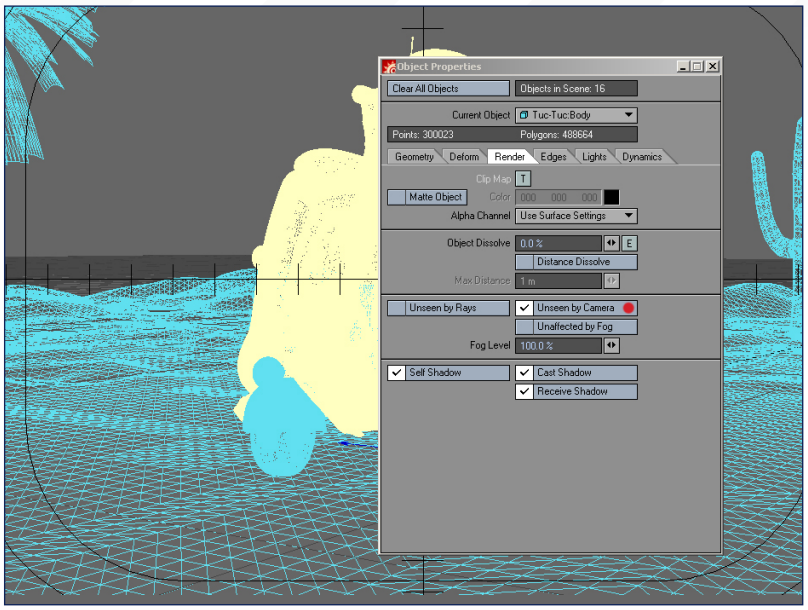
14. In the controls that you see, check “Exposure”. For example, change the settings for White Point to 0.9, and for Black Point change them to 150%. This results in a very contrasted, full and dark look for the image. You can also choose a higher White Point value to over exposure your image.

When done with the manipulating, save the image via the Save Exposed dialogue, or your changes will get lost. Of course, you can also save your image as *.HDR and manipulate it in another software, or even use it as HDR background in another 3D scene (Fig 14).

15. When you want to do any post work to your image, you need good alpha masks. You can render out your scene a few times, each showing or hiding different elements. By working this way you can, for example, render the background and foreground separately in two images that will fit together perfectly.

There are two principles in Lightwave that are quite useful for this kind of output. Select the Tuc-Tuc object and go into Object Properties - check “Unseen by Camera”. Do this for all of the objects that the Tuc-Tuc consists of (Fig 15).

Fig 15



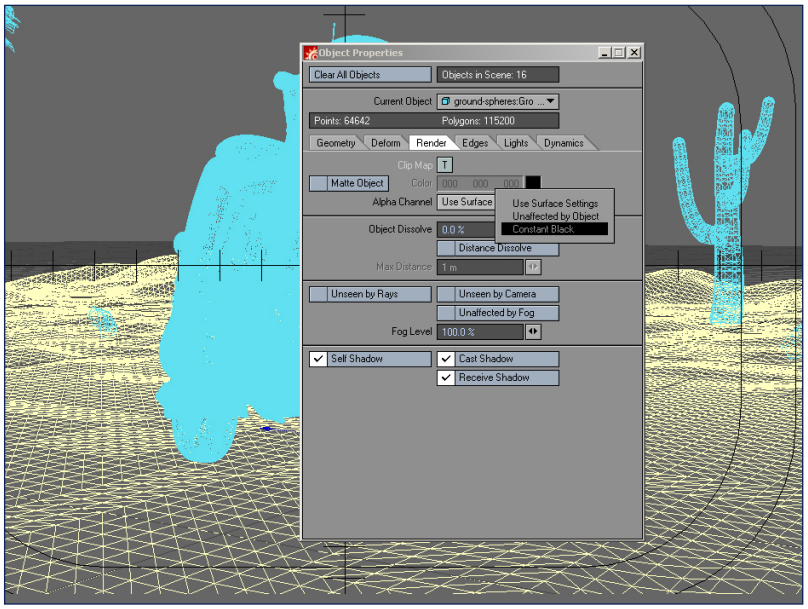
16. When you render the image now you will see that the image does not have the Tuc-Tuc in it, but you can see all of the shadows that it throws on the ground (Fig 16).

Fig16



17. Now un-check “Unseen by Camera” for the objects again. Instead you should now select all of the other objects and choose the Alpha Channel “Constant Black” (Fig 17).

Fig17



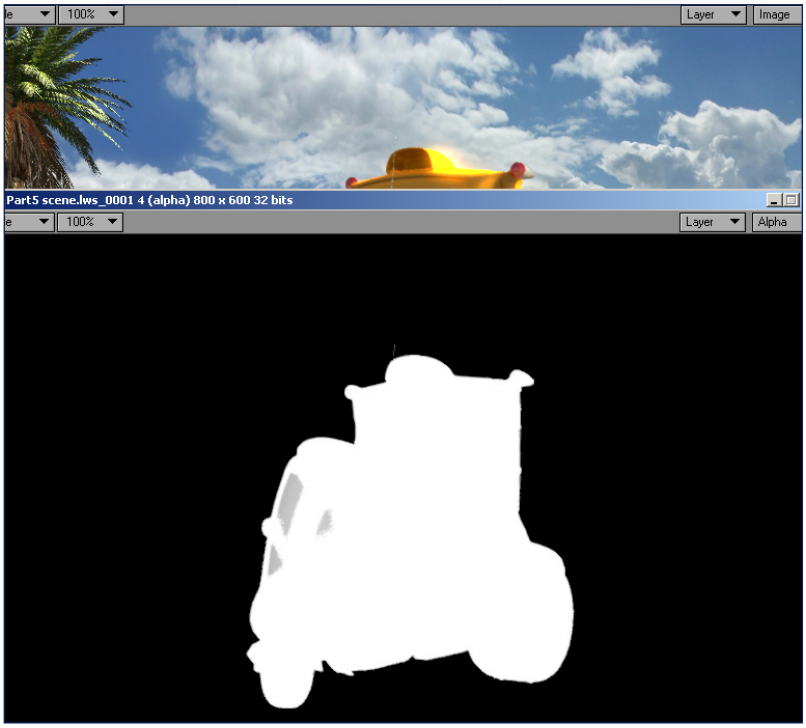


Fig 18

18. The rendered image looks pretty normal, but if you select the alpha you will see that nothing can be seen but the Tuc-Tuc. You can now combine both images in Photoshop, or in any other 2D software. You might then wish to change the background and foreground separately (Fig 18).

Until now we have used rather classic rendering methods. It is pretty comfortable because you hit <F9> and the renderer just pops out your finished image. When working professionally, you often need to use a certain look over and over again, especially when working on different animation sequences. You also need to keep render times low. To solve this problem, the render is output in several passes or layers. How this is done, and how you work with the different layers of one image, will be discussed



in Part 6 of this tutorial (next month). I hope you have enjoyed this overview. If you have any questions, just let me know!

TUC-TUC

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Tutorial by:

ROMAN 'DOUGH' KESSLER

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www.dough-cgi.de
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Maya

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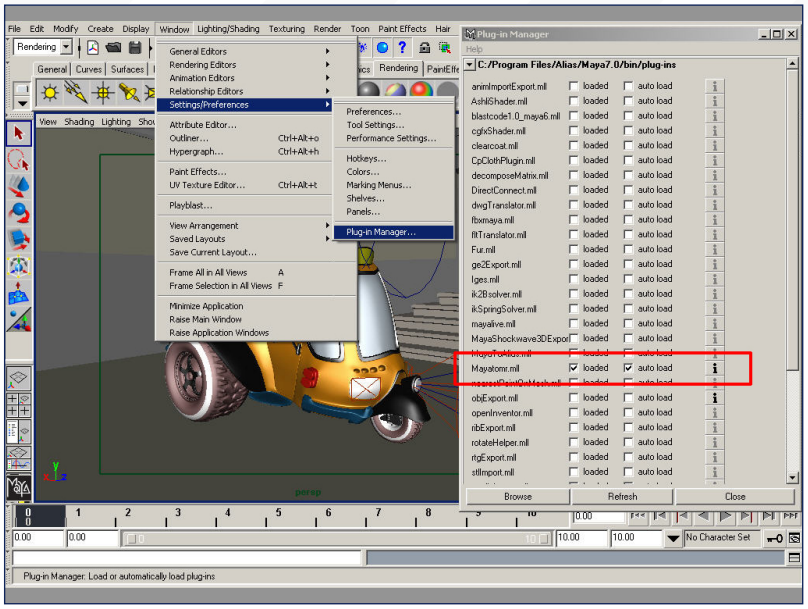
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Rendering Part 1

In this part we are going to discuss Final Gathering (FG) and about how FG can be tuned in order to obtain a realistic illumination, to save render time, and at the same time to achieve high quality images...

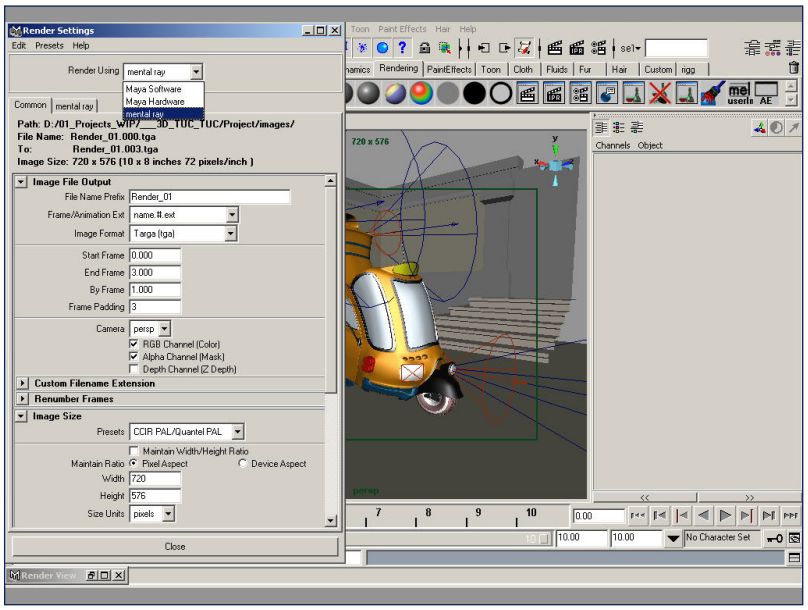
1. The first thing that we might want to check, before doing anything else, is if the Mental Ray plug-in is loaded. Otherwise we cannot render with Mental Ray. For this we need to open the Plug-in Manager (go to Window > Setting/ Preferences) and check that the “Mayatomr. mll” is checked on both the “loaded” and “auto load” boxes, as highlighted in red in Fig 01. By checking the auto load option every time your Maya mayatomr.mll plug-in will be loaded automatically.

Fig 01



2. The next step, once we are sure that the Mayatomr plug-in is loaded in our software, is to open the Render Settings panel and to choose the Mental Ray renderer, as in Fig 02. Then turn off the Maya default light and all the light sources in the scene (or you can just simply hide them instead of turning them off for use later).

Fig 02



3. Now in the Mental Ray tab I’m going to set the quality to “Draft” from the Quality Presets tab. This way, by using draft settings, I will make fast renders, so I can adjust all the properties pretty quickly without wasting too much time on waiting for the render to be made (Fig 03). You should note that the Final Gather has not yet been made active.

Fig 03

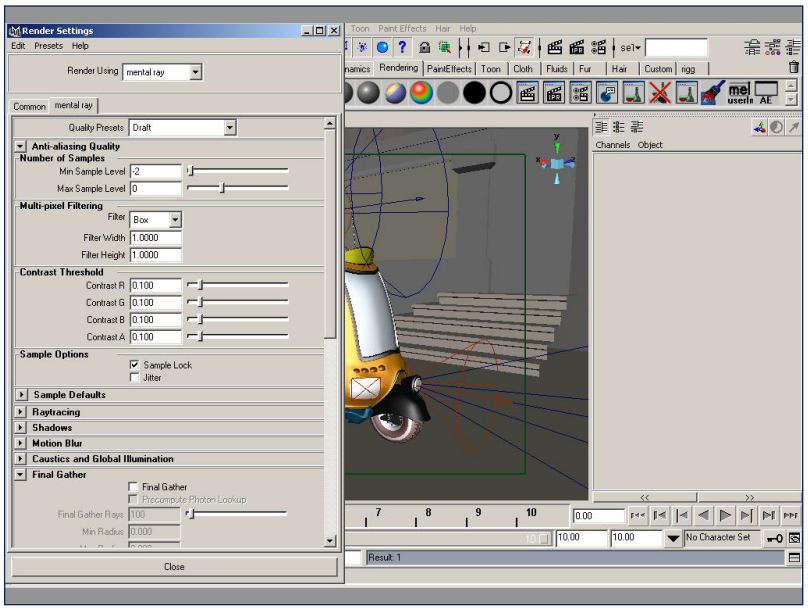




Fig 04

4. In Fig 04 you can see a render without using FG. All the illumination within the scene is from the lights used to simulate the car's lamps and the other two fill lights on the upper-left and lower-right corners. As you can see, we have a pretty cool fog effect going on, with some nice reflections, but that's all. We don't have any shadows and the colours are all pretty flat, but with FG we are going to get a far more dynamic image...

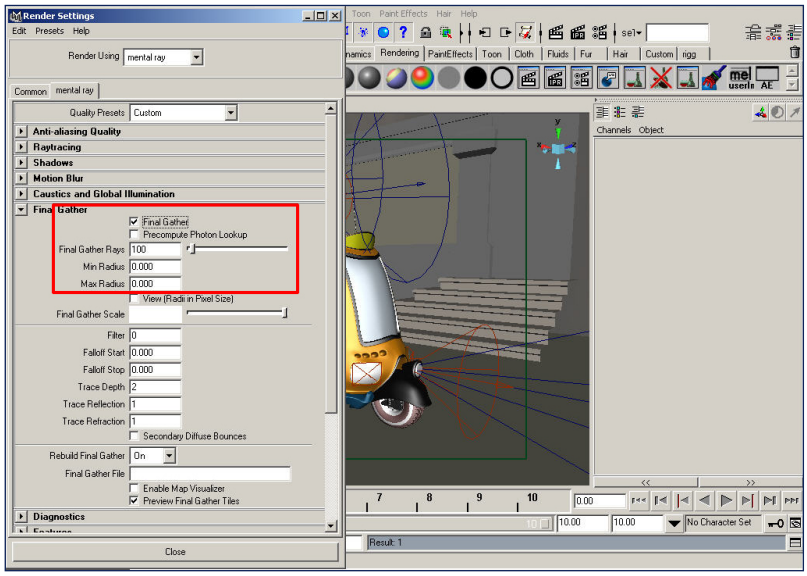


Fig 05

5. Just enable the FG, as in Fig 05, and leave everything as it is by default. When FG is enabled, every object becomes a source of light. If a light ray touches an object, many secondary rays are reflected in random directions around it. This way the object is gathering light information from all of the surrounding objects. The main difference between Global Illumination and Final Gather is that FG does not use photon maps. Instead, it samples the surrounding area above every point in the scene. Now all we have to do is adjust the Final Gather Rays, which represent the number of rays emitted from the camera and the Min/Max Radius, and which are in control of the size of the sampling region within which Final Gather rays search for light information from other surfaces.

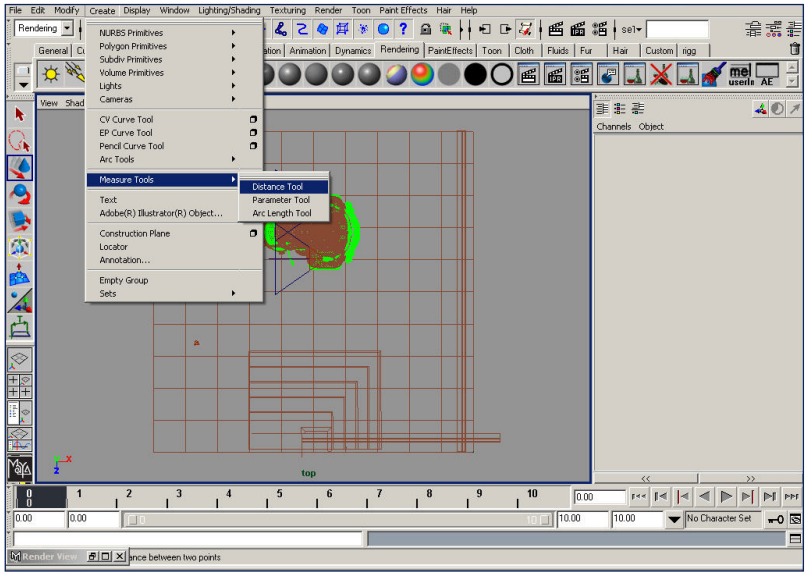
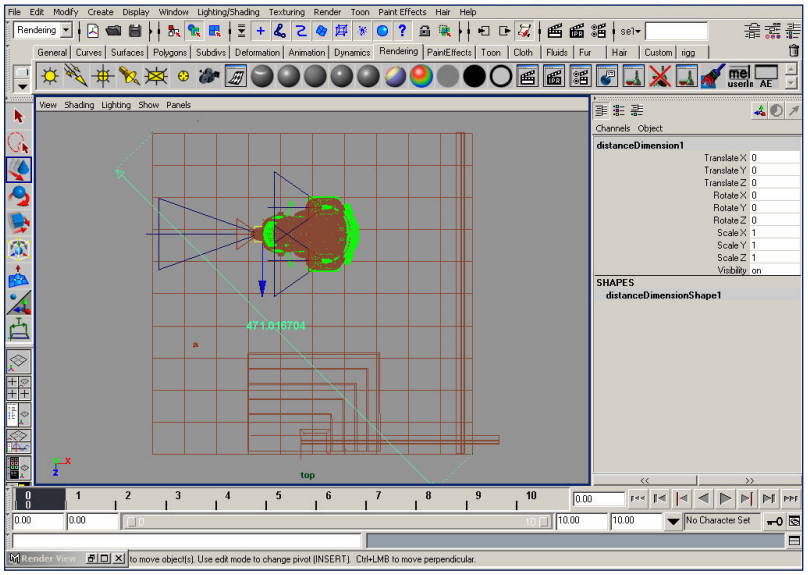


Fig 06

6. I have heard few theories about how Min Radius and Max Radius have to be calculated. I am just going to present the one that gave me best results and plenty of places for fine tuning. Simply pick the Distance Tool and measure the scene (Fig 06).

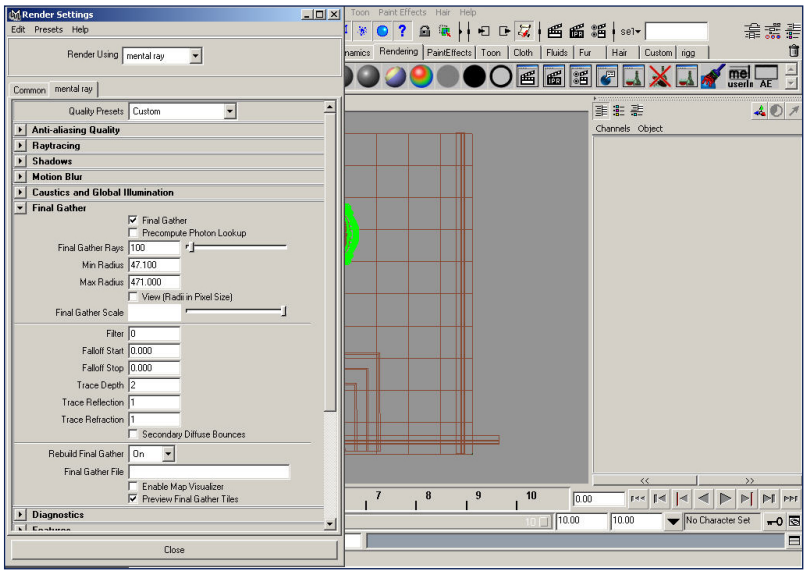
7. Remember that Min/Max Radius is telling Mental Ray what region to take into account for the calculation of the FG rays. So I have measured the diagonal length of my scene because this is what appears to be the longest distance. By doing this I want to be sure that my sampling region is surrounding everything (Fig 07).

Fig 07



8. Now I'll write this number in Max Radius. Here comes the trick: the Min Radius will always be 10% from Max Radius, as in Fig 08. Of course you can try to lower or higher these numbers. The way I see these settings is that if you are lowering those numbers (for example half of them) you'll have much finer details in the scene but you'll also have to increase the number of FG Rays in order to have enough samples to render all of those details. So you have to find the right compromise between FG Rays and the degree of details that you want to have in the final rendered image.

Fig 08



9. Take a quick render of your scene, as in Fig 09. The difference between the first and this render is huge: we now have, by far, a more dynamic ranged image; we have smooth shadows on the wall behind and under the car, we have nice colours and nice contrast regions. All of this is because we've just told Mental Ray to use FG Rays.

Fig 09



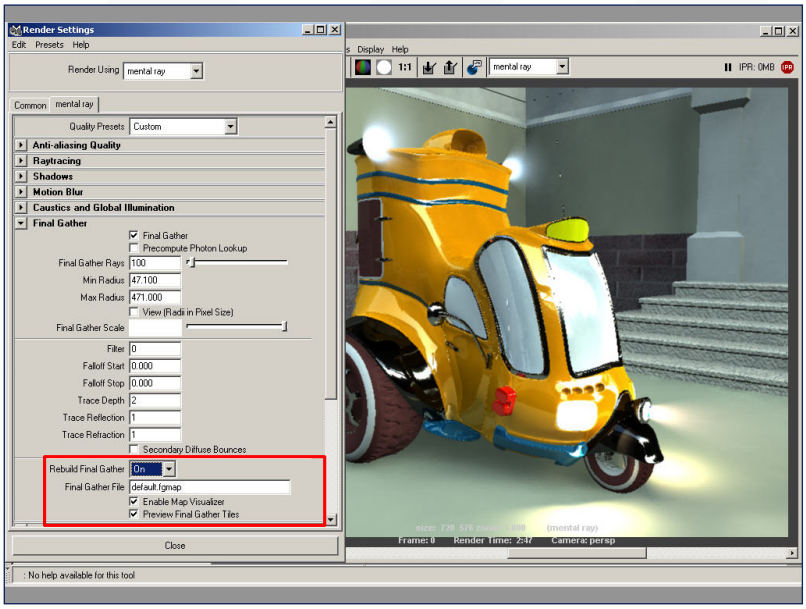


Fig 10

10. Now it's time to start adjusting some settings. The first important thing is that you can re-use the FG Map. Once you have made one render and you are happy with FG Rays and the Min/Max Radius, then you can just tell Mental Ray that every time it does a new render to use the FG Map rendered the very first time. So to do this you must firstly make sure that "Rebuild Final Gather" turned ON, as in Fig 10. Any previously generated Final Gather file is ignored, and all Final Gather points are re-computed.

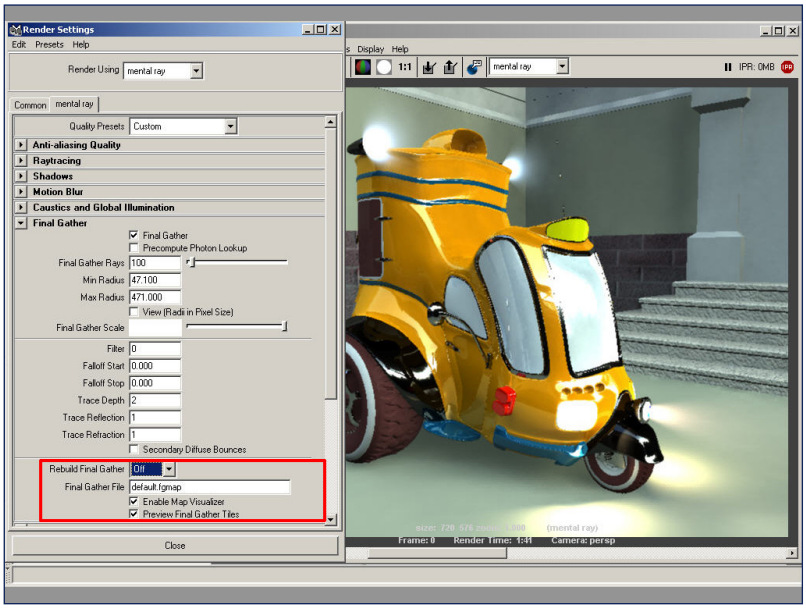


Fig 11

11. If Rebuild Final Gather is switched OFF, Mental Ray will use the results from the previous Final Gather render - you will save a huge amount of time! For example, I have saved more than a minute - almost 50% (see "Render Time" in the Render window in Fig 10 (2:47) and Fig 11 (1:41)). Notice that I have also checked "Enable Map Visualizer" and "Preview FG Tiles". The first one will show me FG samples in the scene and the last one will show me, in the Render window, the FG rendered samples. Just go ahead and disable/enable those settings in order to get comfortable with them.

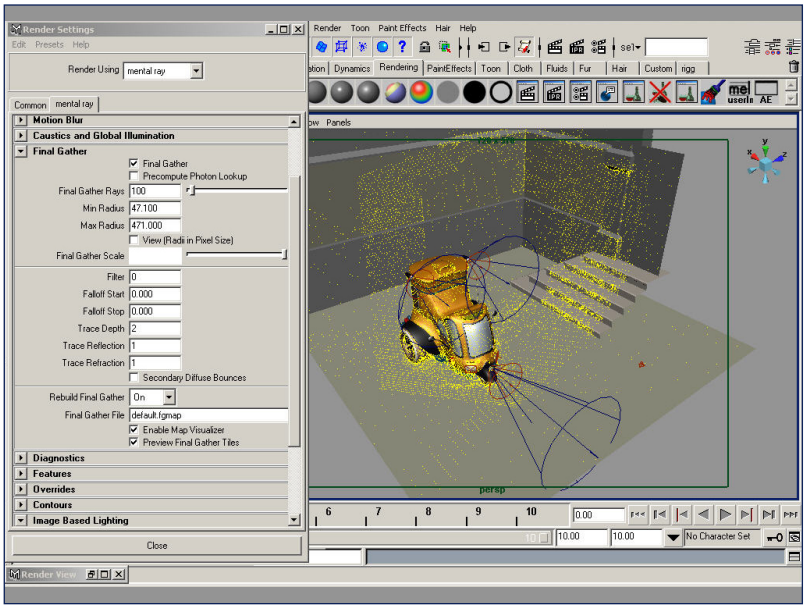
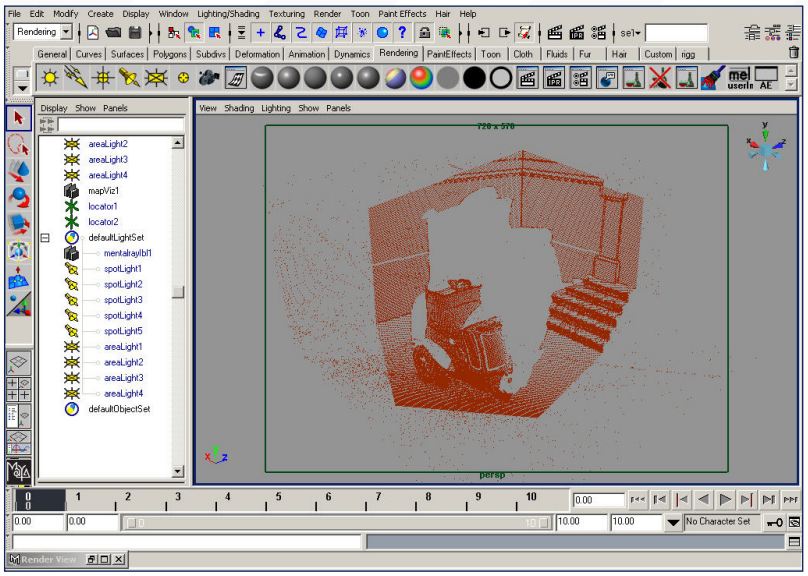


Fig 12

12. As you can see in Fig 12 I can see the entire distribution of the FG points pretty well throughout my scene. An important aspect is that I can add an FG point to an FG Map just by simply rendering the image from different views. In this image I have made 2 opposite renders: one from the lower-left corner and the other one from the stairs. You can see that I have FG points on both sides of my car.

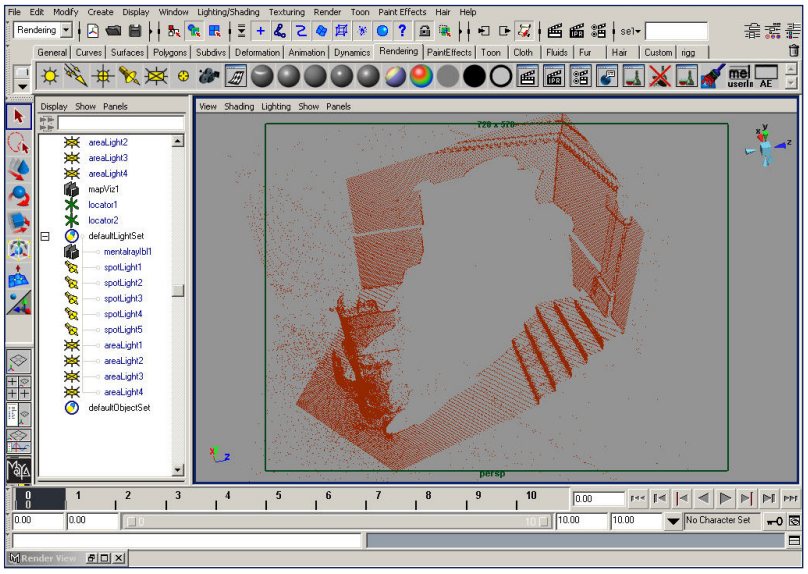
13. In Fig 13, I have made only one render from the lower-left corner, and as you will very easily notice, I have no FG samples behind my car. This means that the camera doesn't see anything behind the car and so it hasn't calculated what's happening there. This is a very important aspect if you want to use re-use FG Maps.

Fig 13



14. I have made a screenshot of another view in Fig 14 for you to see more clearly what's happening in the scene. As you can see I have no FG samples behind my car. So generally speaking you can re-use an FG Map if the camera is not moving. This way you'll save a lot of rendering time. The difference can be really important so it probably would be ideal to have a good understanding of this aspect. You can see and select this map in Outliner: mapViz1. Simply select it and hide the rest of the scene.

Fig 14



15. In Fig 15 I have made a render re-using my FG Map and the time saved was pretty significant: almost 1/3 of my time. Just imagine if you have to render many frames with a still camera...

Fig 15



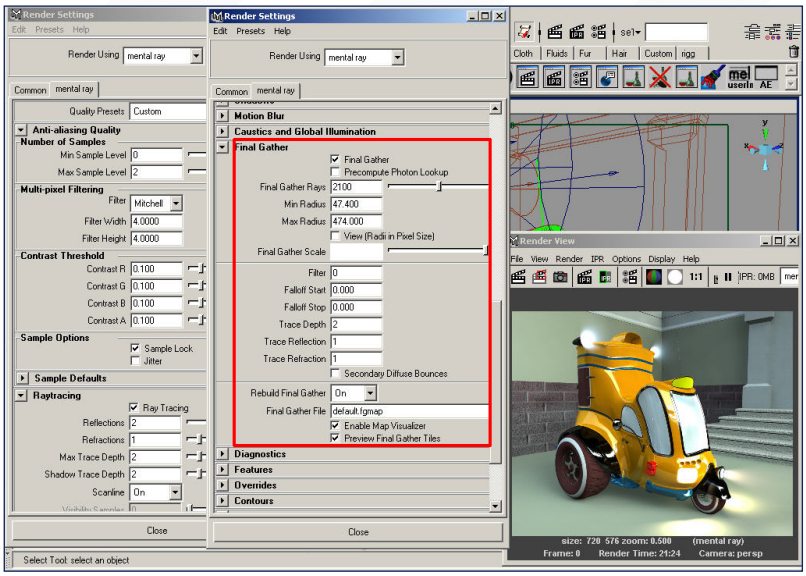


Fig 16

16. The settings used for this render are visible in Fig 16. Notice that I have a pretty high number set in Final Gather Rays. I am adjusting this number starting from 100 then 300 and I am adding 300 rays at each step until either I don't see any difference between the current and the previous rendered image, or the render time is too high and I should start adjusting some other settings like the Min/Max Radius, Falloff (which is telling Mental Ray at what distance to stop calculating the FG Illumination coming from other objects), or Filter (which is pretty much like any other filter: the higher the number the better the degree of details and also the render time is increased).



Fig 17

17. Now once pleased with the quality of my image I would like to do one more thing... In Fig 17 I have hidden all of the lights in my scene in order to better see what's happening with those reflections. They are very good nevertheless, although I would prefer them to be more blurry and glossy.



Fig 18

18. To save time I'll simply lower all the settings from my Render Settings to Draft again, and I am just going to work on the chassis to render faster, and to see the differences better (Fig 18).

19. So open your Material Attributes window and you'll see there a "mental ray" section. Open it and you'll find the settings needed to be adjusted: Reflection Blur and Reflection Rays. In case you have transparent glass, windows, water, etc., then you might want to work also on Refraction Blur and Rays. But I'm not having anything transparent in the scene so I'm not worried about refraction. Now these settings will greatly increase the rendering time, so only increase them step-by-step until you're happy with the final result. I've found the settings from Fig 19 to be pretty good for my needs. Don't forget to do this on every material that' is reflecting.

Fig 19

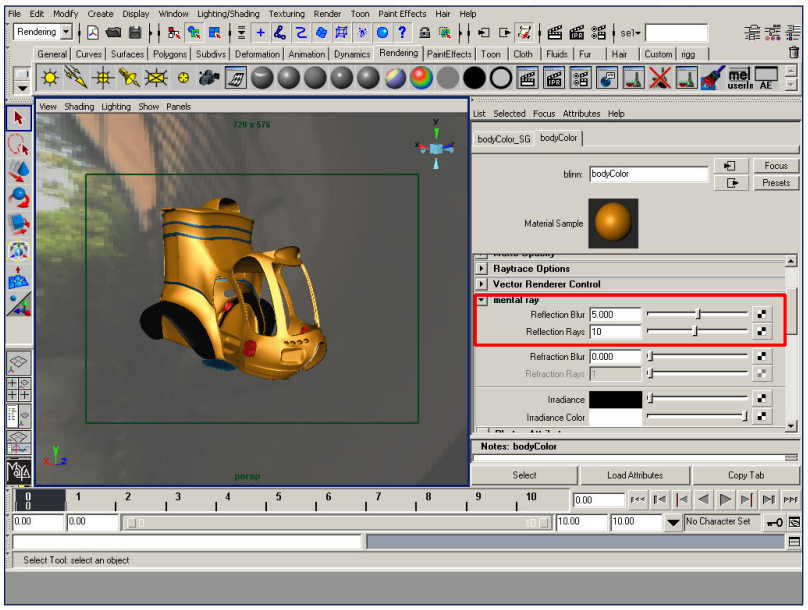


Fig 20



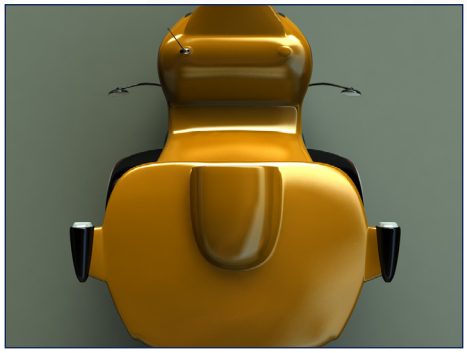
20. As you can see in Fig 20 I now have a pretty cool blurry and glossy reflection.

And that's it for this part! I'll see you next time with Global Illumination and a few other tricks...

TUC-TUC

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Tutorial by:
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Tuc-Tuc

SOFTIMAGE | XSI

Is our new precise, step-by-step tutorial which will begin with a vehicle model and cover the principals of applying shaders, placing it in a simple scene and following with a two-part section on both lighting and rendering. The tutorial will begin by creating and applying materials for the various parts of the car, such as glass, chrome and tyres, as well as texturing some simple geometry that will make up a scene. It will then move onto lighting where the focus will be on setting up a lighting rig and the various parameters connected to this. Finally the series will culminate with a section on rendering, where the aim will be to finish with a polished image. The schedule is as follows:

Issue 017 January 2007
Applying Materials & Shaders Part 1

Issue 018 February 2007
Applying Materials & Shaders Part 2

Issue 019 March 2007
Lighting Setup & Rig (with HDRI) Part 1

Issue 020 April 2007
Lighting Setup & Rig (with HDRI) Part 2

Issue 021 May 2007
Rendering Part 1

Issue 022 June 2007
Rendering Part 2

Enjoy ...

Rendering Part 1

In this part of the tutorial we'll see some common rendering techniques in action. We'll have a look at Ambient Occlusion and DOF (depth of field). The last part (next month) will be dedicated to rendering optimization (Antialiasing techniques, image composition and retouching in Photoshop).

Let's start with Ambient Occlusion (AO). It's a fairly recent technique used to achieve more realism in rendering. Not so long ago you would have had to have do some tricky stuff to obtain an AO pass to composite with the final rendered image, but finally every software package has included tools for generating AO passes directly and easily. So let's see how XSI handles this...

1. Open the Tuc-Tuc_HDR scene (which was included with last month's part of the tutorial) and render it. Save the result in any picture format you like (Fig 01).

2. Select an object in the scene (for example, the Floor mesh) and assign a new Phong material to it. Name it "AO_Phong", or something similar to this (Fig 02).

3. Open the Render Tree and create a new Ambient Occlusion node (Nodes – Illumination – Ambient Occlusion). Plug it into the Material's Surface node (Fig 03).

Fig 01



Fig 02

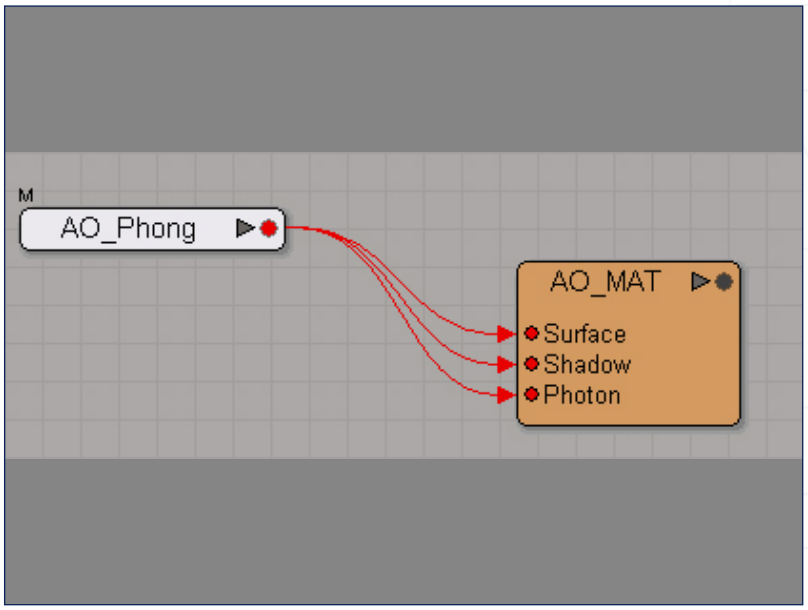
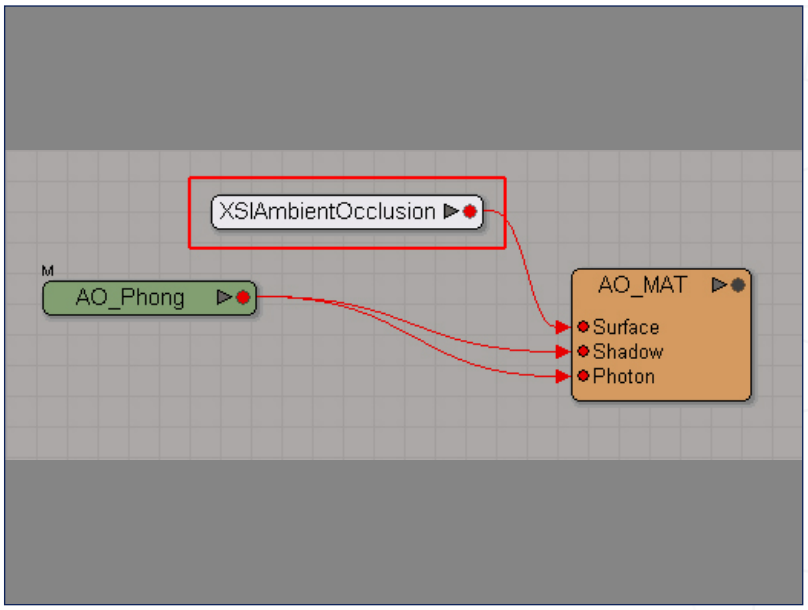


Fig 03



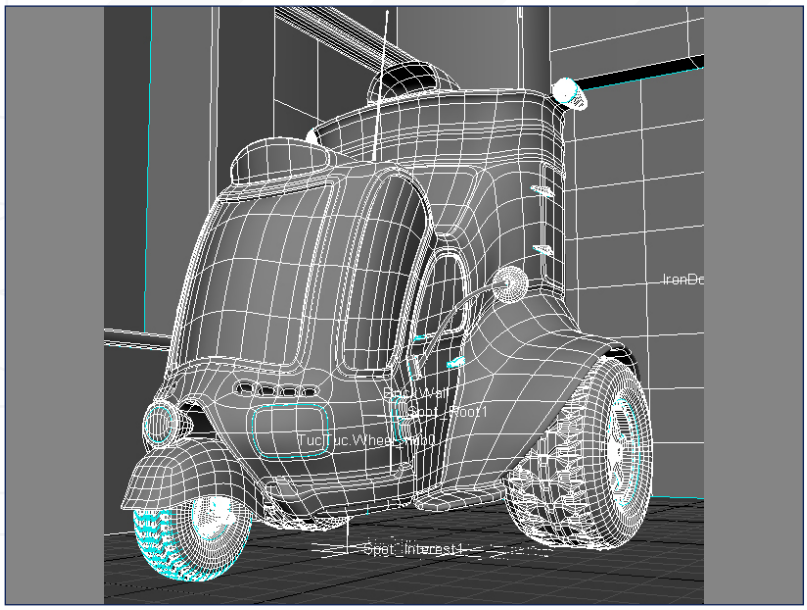


Fig 04

4. Select all the other scene elements (you can use Select – Invert Using Filter command) and assign the same AO_Phong material to them (Fig 04).



Fig 05

5. Render the scene again (of course, use the same camera or viewport as before). You should get something similar to what can be seen in Fig 05. This is called “Ambient Occlusion”.

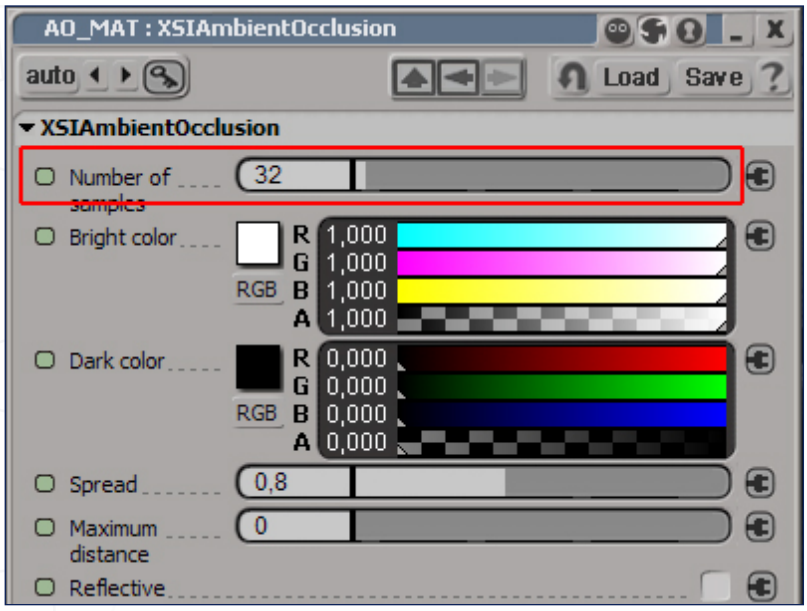
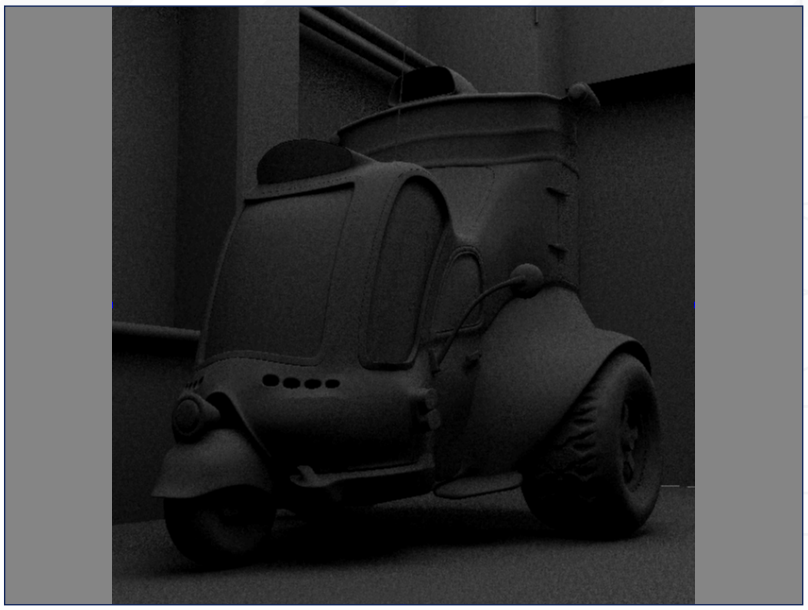


Fig 06

6. As you can see, the quality of the AO pass is not good, so we need to increase the samples. Simply double-click on the AO node in the Render Tree and pump up the Samples value (Fig 06).

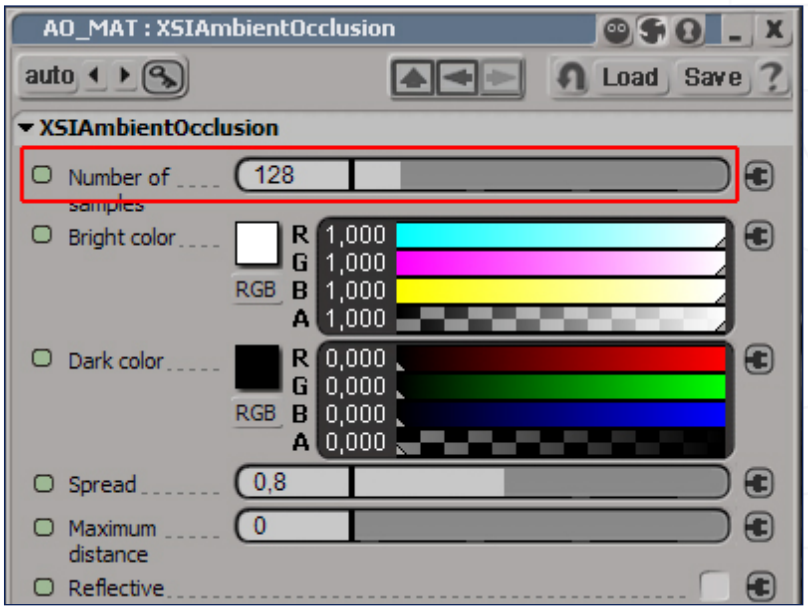
7. Now render the scene again. The AO is now looking much better, but it's still not enough (Fig 07)...

Fig 07



8. So, enter a higher value of Samples in the AO node (Fig 08).

Fig 08



9. Render the scene again. It now looks a lot better, and we can composite this AO pass in Photoshop, or in other similar 2D programs. Save the AO pass render in a separate file (Fig 08).

Fig 09



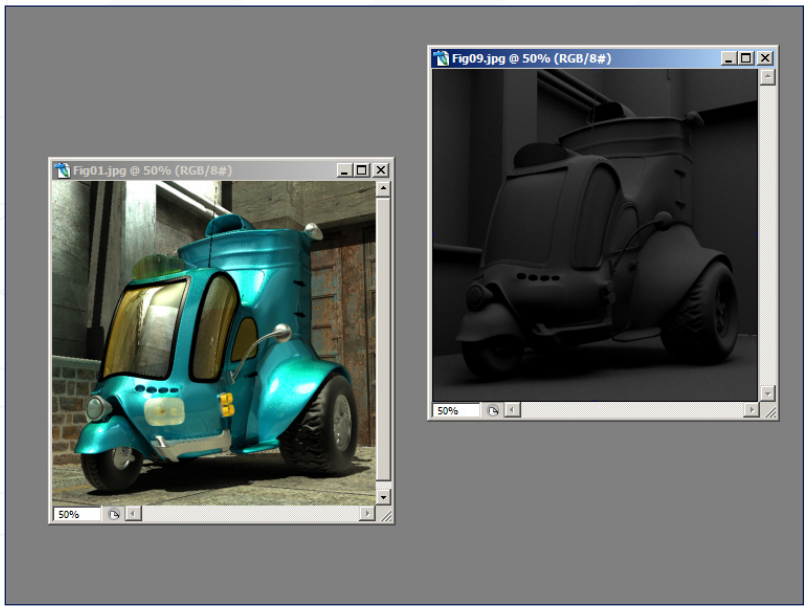


Fig 10

10. Open Photoshop and import both the original rendered image and the AO pass (Fig 10).

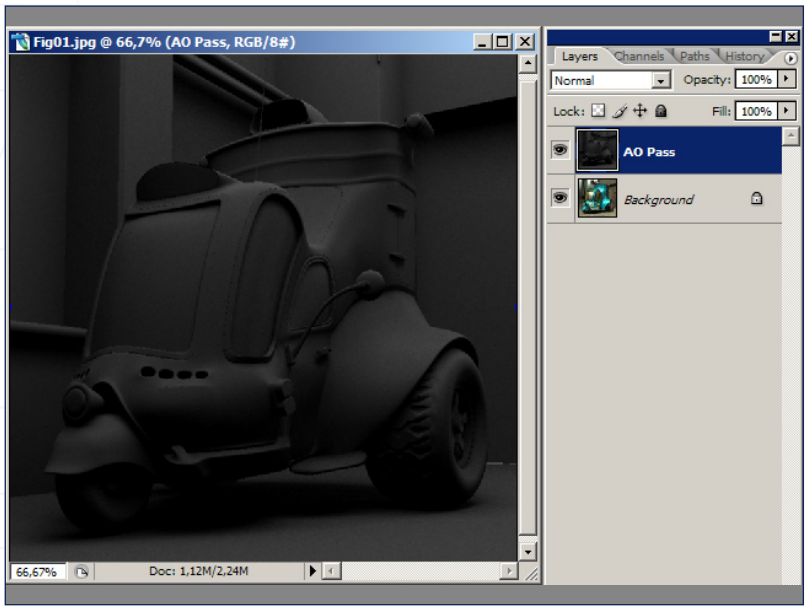


Fig 11

11. Switch to the AO pass picture, then Select All (<Ctrl> + <A>) and Copy (<Ctrl> + <C>). Go back to the original rendering and paste the AO pass into it (<Ctrl> + <V>). Rename the new layer “AO_Pass” (Fig 11).

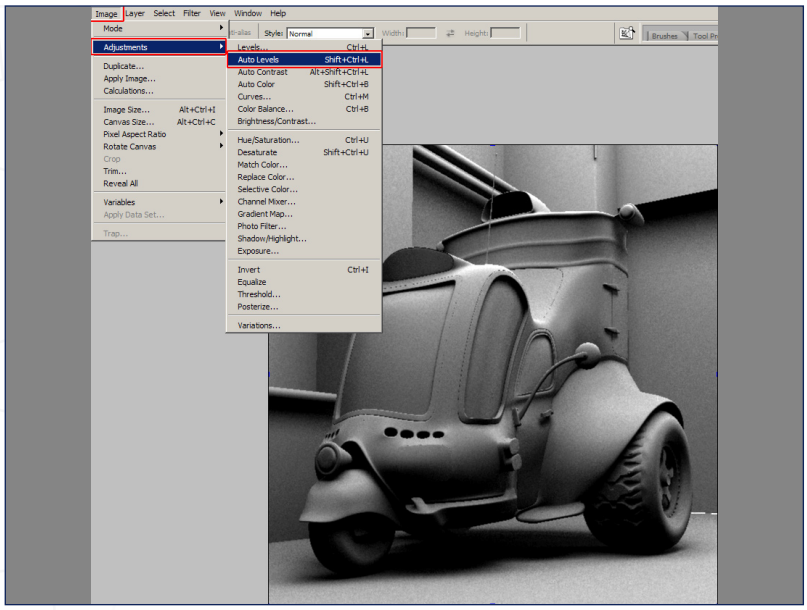
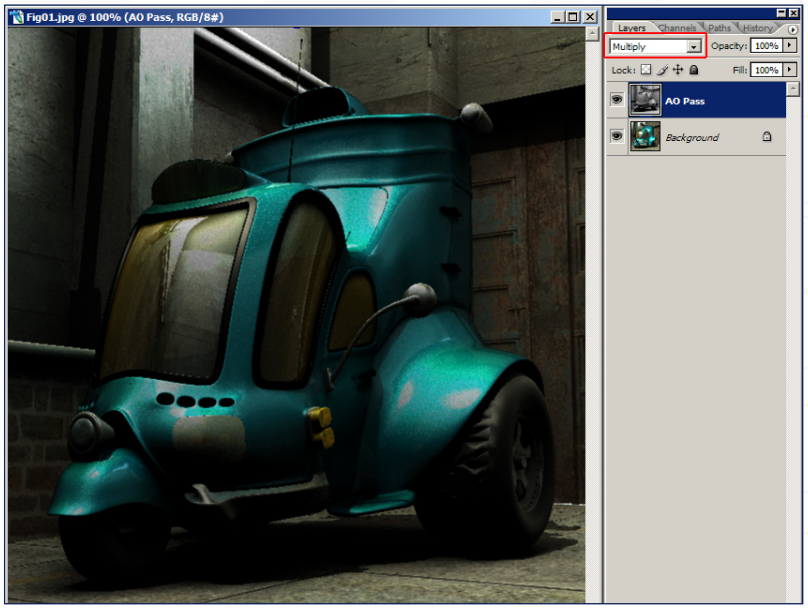


Fig 12

12. If the AO pass looks too dark, you can simply use the Auto Levels command to let Photoshop handle the levels (Fig 12).

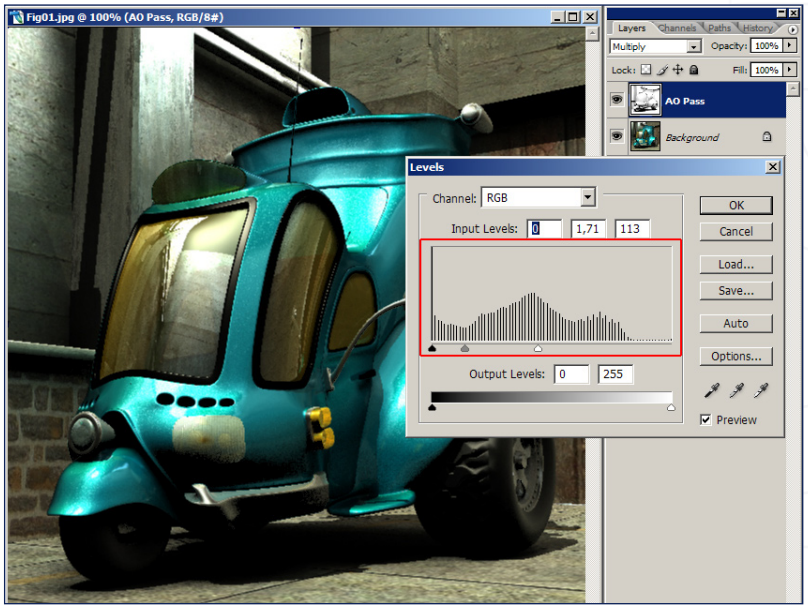
13. Change the blending mode for the AO_Pass layer, and set it to Multiply (Fig 13).

Fig 13



14. Now you can open the Levels window and change the AO_Pass levels as you wish (Fig 14).

Fig 14



15. You may also need to change the Opacity and Fill values for the AO_Pass to get achieve better results (Fig 15).

Fig 15



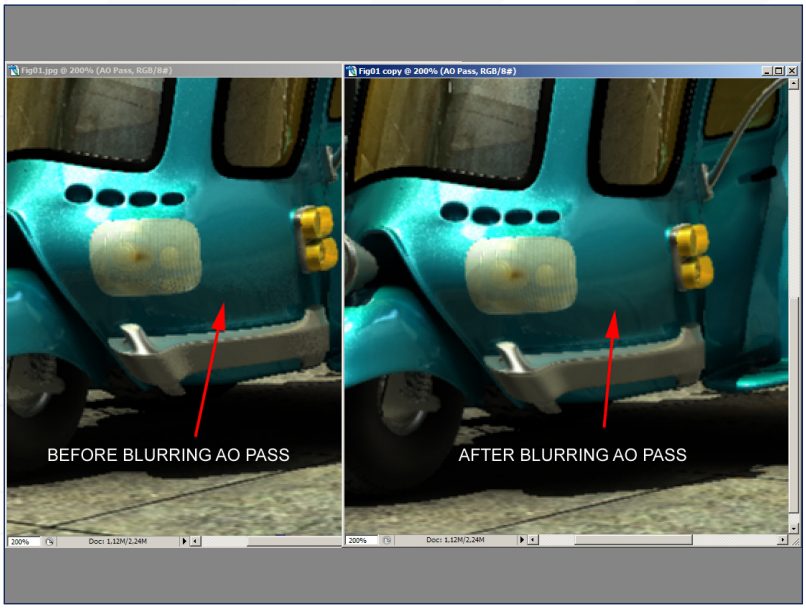


Fig 16

16. If you take a closer look at the composite, you may notice some artifacts caused by a low Samples value for the AO rendering. In this case, you can either re-render the AO pass with a higher Samples value (which may require some higher render time), or you can simply apply a blur filter to the AO_Pass layer in Photoshop (which requires zero time, but it is not very precise) (Fig 16).

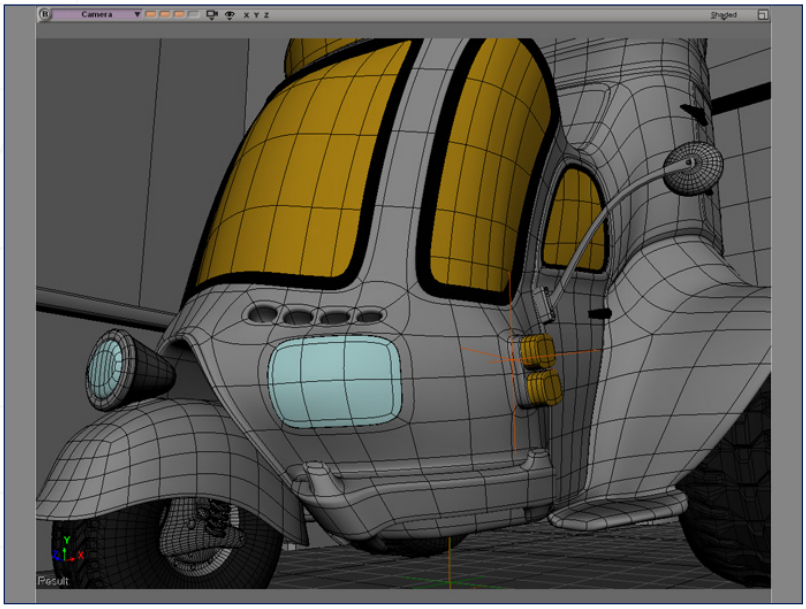


Fig 17

17. Now let's see how to use the DOF effect, combining XSI's rendering and Photoshop post-production. Open the TucTuc_HDR scene again and choose a nice shot for your render (Fig 17).

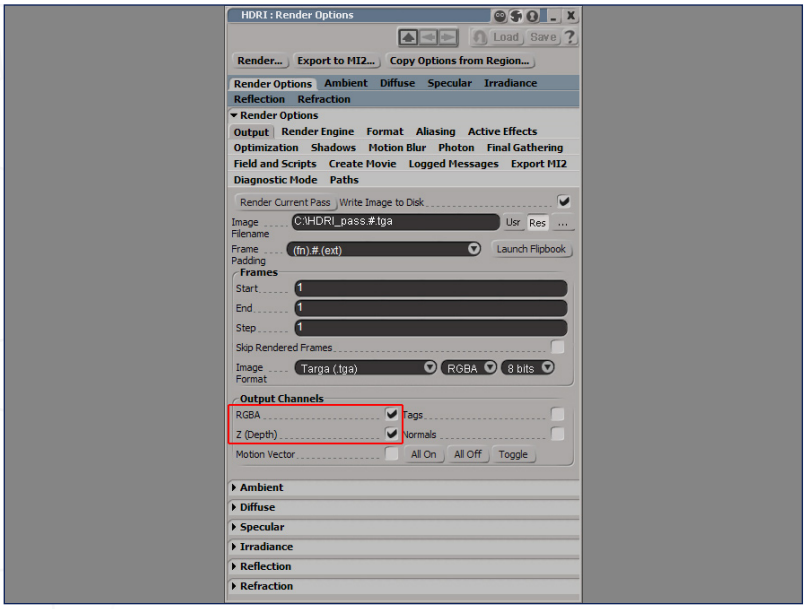
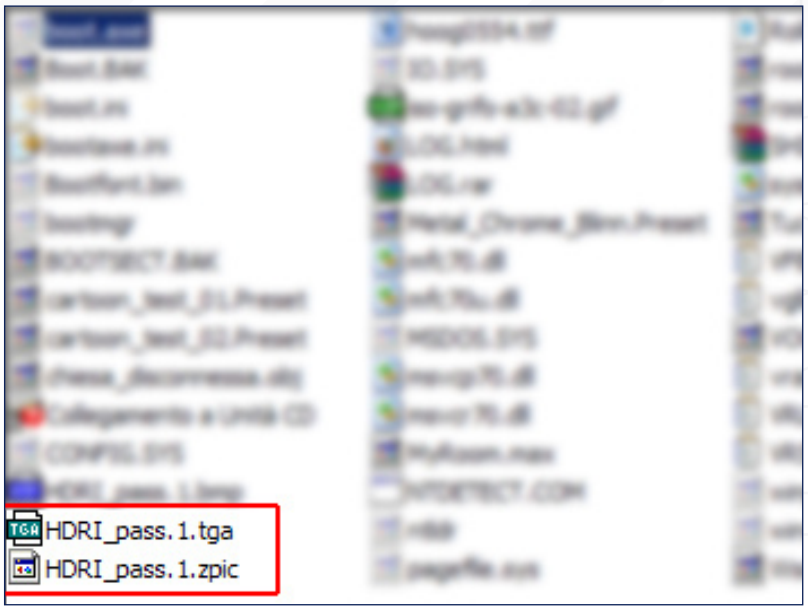


Fig 18

18. Open the Rendering panel and make sure that the RGBA and Z (Depth) options are both activated in the Output Channels section. This will make XSI render two different images: one for the original render, and one which will contain information about the depth of the scene (Fig 18).

19. After XSI finishes the rendering task, if you open the project folder you will have two rendered files: “HDRI_Pass.1.TGA” and “HDRI_Pass.1.zpic”. The latter is in a format that you can only be read inside XSI and composite with XSI’s internal tools. Since not every XSI version has this feature (Foundation doesn’t for example), we’ll use a different way here.

Fig 19



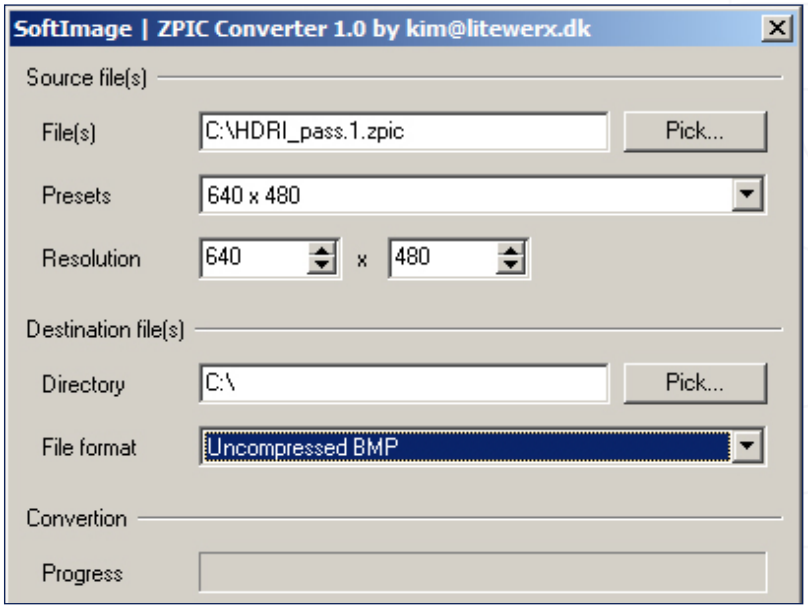
20. To do this you’ll need to download a free tool from **Highend.com**:

http://www.highend3d.com/softimage/downloads/tools/image_utilities/36.html

This is a free converter which converts from the .zpic format to JPG or BMP.

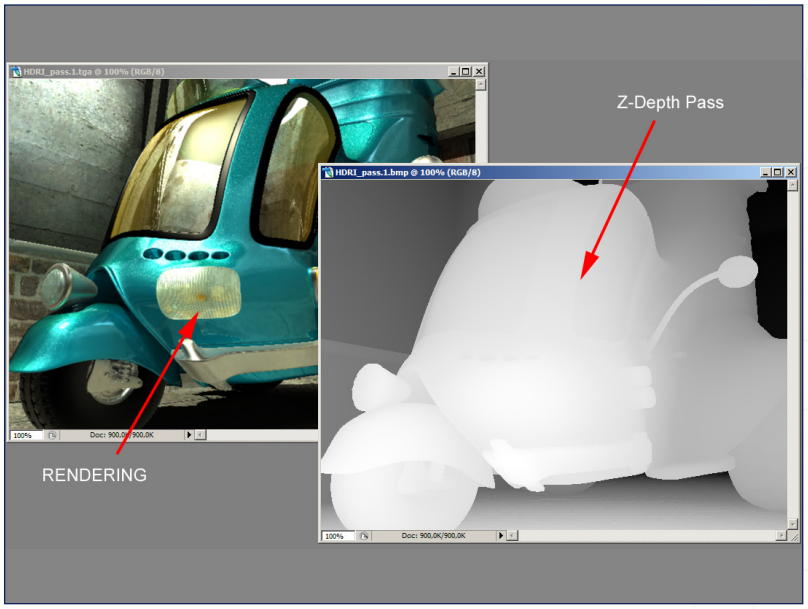
Download this and install it, then launch the application and convert the .zpic Zdepth pass into a Photoshop-capable format (JPG or BMP) (Fig 20).

Fig 20



21. Open Photoshop and import both the original rendering and the converted Zdepth pass (Fig 21).

Fig 21



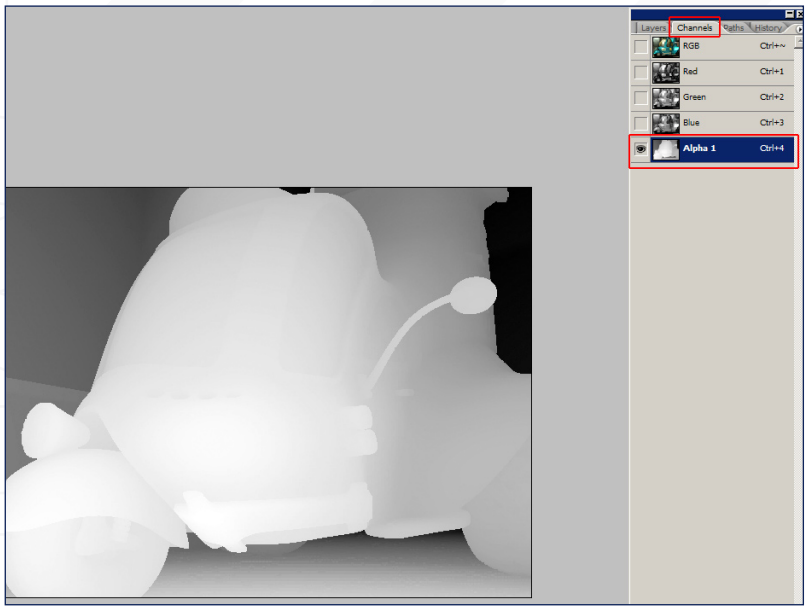


Fig 22

21. Switch to the Zdepth pass picture and Select All (<Ctrl> + <A>) and Copy (<Ctrl> + <C>). Switch to the original rendering, and go to the Channels tab. Select the Alpha channel (if your picture does not have one, just create a new channel) and Paste (Ctrl + V) the zdepth information into it (Fig 22).

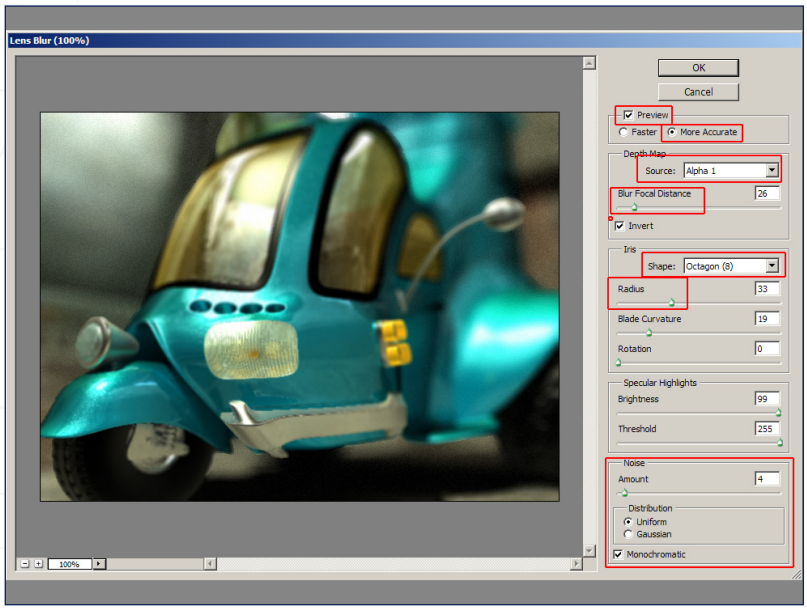


Fig 23

23. Now go back to the RGB channel of the picture and apply a Lens Blur effect. Assign the Alpha Channel as source and play a bit with the filter's parameters, like shown in Fig 23. You can also modify the Alpha channel levels to obtain different a different intensity for the DOF effect.

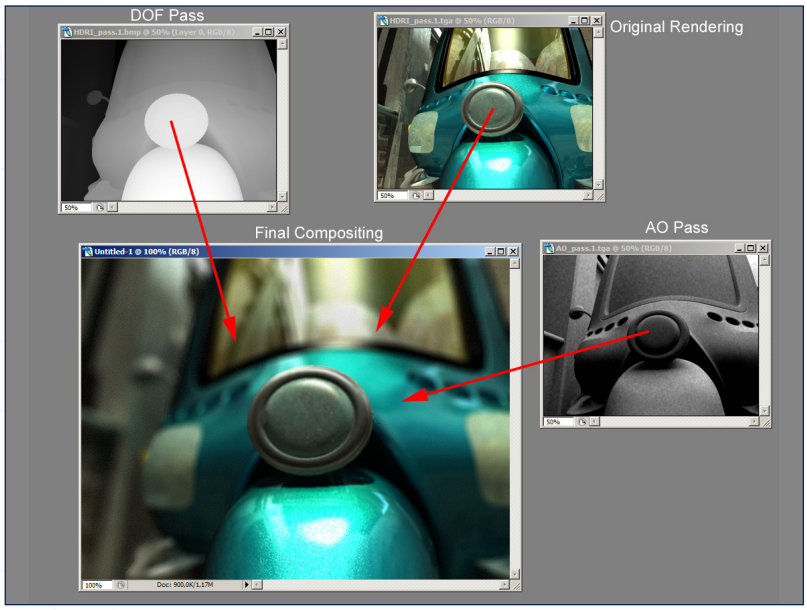


Fig 24

24. In Fig 24 you can notice a rendering from a different point of view, and both the AO and DOF techniques applied together.

Tuc-Tuc

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